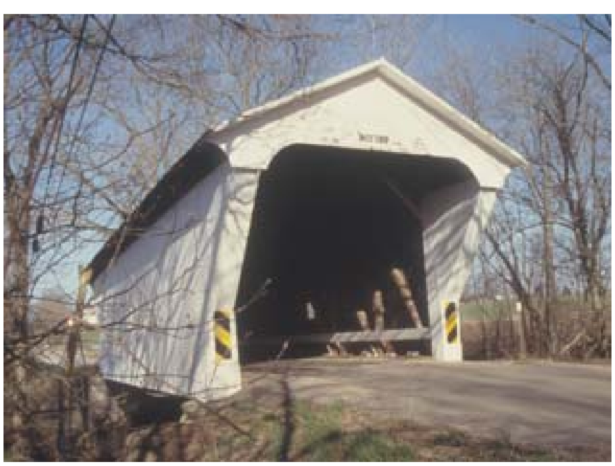
United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Ohio Department of
Natural Resources,
Division of Soil and Water
Conservation; Ohio
Agricultural Research and
Development Center; Ohio
State University Extension;
Preble Soil and Water
Conservation District; and
Preble County
Commissioners

Soil Survey of Preble County, Ohio



How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

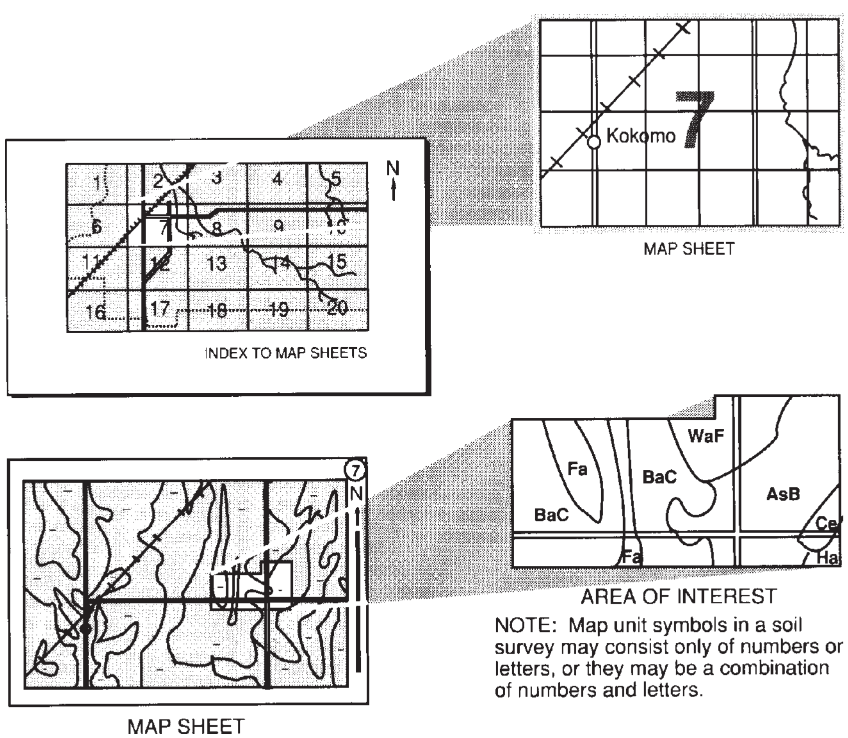
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and go to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Go to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2002. Soil names and descriptions were approved in 2004. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2002. This survey was made cooperatively by the Natural Resources Conservation Service; the Ohio Department of Natural Resources, Division of Soil and Water Conservation; the Ohio Agricultural Research and Development Center; the Ohio State University Extension; the Preble Soil and Water Conservation District; and the Preble County Commissioners. The survey is part of the technical assistance furnished to the Preble Soil and Water Conservation District. The Preble County Board of Commissioners provided financial assistance for the survey.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

The United States Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, or, where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, or political beliefs, as a means of reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call 800-795-3272 (voice) or 202-720-6382 (TDD). USDA is an equal opportunity provider and employer.

Cover: Preble County is home to seven covered bridges. They are (in order from left to right and top to bottom) Harshman, Brubaker, Christman, Roberts, Dixon Branch, Warnke, and Geeting. Roberts Bridge is the oldest and only remaining "double barrelled" covered bridge in the State of Ohio and is one of only six that remain standing in the United States.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Contents

Issued 2006

Foreword

This soil survey contains information that affects land use planning in Preble County. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Ohio State University Extension.

Terry J. Cosby
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Preble County, Ohio

By John R. Allen and Doug B. Dotson, Natural Resources Conservation Service, and Matthew H. Deaton, Stephen J. Hamilton, and Terrence E. Lucht, Ohio Department of Natural Resources, Division of Soil and Water Conservation

Fieldwork by John R. Allen and Doug B. Dotson, Natural Resources Conservation Service, and Matthew H. Deaton, Stephen J. Hamilton, and Terrence E. Lucht, Ohio Department of Natural Resources, Division of Soil and Water Conservation

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
Ohio Department of Natural Resources, Division of Soil and Water Conservation; Ohio Agricultural Research and Development Center; Ohio State University Extension; Preble Soil and Water Conservation District; and Preble County Commissioners

Preble County is in the southwestern part of Ohio (fig. 1). Preble County is bordered by Union County, Indiana, and Wayne County, Indiana, on the west, by Butler County on the south, by Montgomery County on the east, and by Darke County on the north. The total area of the county is 272,947 acres, or about 426 square miles.

In 2000, the population of the county was 42,337. This shows an increase of 2,224 residents, or 5.5 percent of the population, since 1990. Eaton, the county seat and largest community, is near the center of the county. It had a population of 8,133 in 2000. In 2000, other communities and their populations were as follows: Camden, 2,302; Lewisburg, 1,798; New Paris, 1,623; West Alexandria, 1,395; and Gratis, 934 *(37)*.

Much of Preble County is well suited to agriculture. Corn, wheat, soybeans, and hay are the principal crops. Wetness is a major limitation affecting the use of many soils in the county. The land is more dissected and sloping on terminal moraines and along stream valleys *(5, 19, 21)*.

This soil survey updates the survey of Preble County published in 1969 *(28)*. It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the County

This section gives general information about the county. It describes history; physiography, relief, and drainage; glacial geology; bedrock geology; transportation; and climate.

History

In 1798, John Leslie established the first settlement of European immigrants in the survey area along Elk Creek in present-day Gratis Township. There were earlier Indian

Figure 1.—Location of Preble County in Ohio.

settlements in the survey area. Later settlers, mainly from Virginia, Pennsylvania, North Carolina, and Kentucky, moved progressively west and north across the survey area. By 1803, most of present-day Preble County had been settled *(14, 28)*.

Preble County was formed from Montgomery and Butler Counties on March 1, 1808. It was named for Captain Edward Preble, who had distinguished himself as a naval commander in the Revolutionary War. William Bruce, proprietor, laid out Eaton, the county seat, in 1806. The county seat was named after General William Eaton, who served in the Revolutionary War *(28)*.

Preble County is home of Fort Saint Clair, which was erected in 1791-1792 and includes the graves of Lt. Lowry and others killed during conflicts with the Indians. In addition, the county has numerous covered bridges, including Roberts Bridge, built in 1829. Roberts Bridge is the oldest and only remaining "double barrelled" covered bridge in the State of Ohio and is one of only six still standing in the United States.

Physiography, Relief, and Drainage

Preble County is part of the Central Lowland Province. The land surfaces of Preble County fall into five general divisions: (1) nearly level flood plains and low alluvial terraces of the stream valleys; (2) slightly higher, nearly level to gently undulating benches or outwash deposits of the glacial valleys; (3) rolling to steep valley walls, produced either by stream dissection or constructive morainal deposits; (4) dominantly undulating divides of the general upland level (mainly on the till plains); and (5) recessional or end moraines and kames that protrude above the general upland level. One of the moraines that is unique to Preble County has areas of large glacial rocks at or near the surface. This moraine, called the Farmersville Moraine, extends from the northwestern part of the county to near Eaton and angles to the east into Montgomery County *(13, 28)*.

In general, the slope pattern is complex in the uplands and uniform and simple along the larger drainageways. Relief ranges from nearly level to steep, but the land surface is dominantly undulating. Nearly level areas occur principally on stream flood plains, outwash plains, valley trains, and stream terraces and in upland depressions and flats, particularly on the till plains. Hilly to very steep areas occur most extensively

along the valley walls of the major drainageways and in the moraines. The steepest areas are in the southern portion of the county, extending from Hueston Woods State Park in the southwest to near the villages of Gratis and West Elkton in the southeast. Another highly dissected area is near the village of New Paris in the northwestern part of the county along or near the Whitewater River.

The highest elevation in the county, about 1,220 feet above sea level, occurs about 5 miles west of Eaton in Jackson Township. The lowest elevation, about 768 feet above sea level, is in the southern portion of the county where Seven Mile Creek crosses the county line *(28)*.

Most of Preble County drains south-southeast to the Great Miami River. Major streams include Twin Creek in the eastern part of the county, Seven Mile Creek in the central part, and Four Mile Creek in the western part. The Whitewater River, in the northwestern part of the county, drains southwest into Indiana *(25)*.

Glacial Geology

Preble County lies entirely within the glaciated region of Ohio. The entire county is located within the Indiana and Ohio Till Plain (Major Land Resource Area 111) *(28)*.

Two moraines in the county indicate various advances and retreats of the Wisconsinan ice sheet (fig. 2). The more noticeable moraine has rolling topography and is associated with the Camden Moraine that transects the county from the northwest, near New Paris, to the southeast, near West Elkton. Further east and north is the Farmersville Moraine, which is less visible in topographic differences from the ground moraine but is characterized by the presence of large boulders and stones. Most of these boulders and stones have been removed from crop fields and used to form fence lines or placed in woodlots.

There are two dominant types of glacial deposits in the county (fig. 3). The first is till which consists largely of clay mixed with boulders, gravel, sand, and silt. This unsorted material was deposited directly by glacial ice without subsequent reworking by meltwater. The second type is outwash which consists of stratified sand and gravel that was sorted and deposited by running meltwater from the glacial ice. Major outwash areas occur along the Whitewater River as well as along Twin, Seven Mile, and Four Mile Creeks and their tributaries *(13)*.

Most of the western quarter of the county was later covered by windblown material, called loess. The loess had the effect of filling in low areas and resulting in broad, nearly level landscapes interrupted only by a dissected landscape along Four Mile Creek to the southwest. This dissected landscape is known locally as the Boston Plains. The soils east of the Camden Moraine generally have little or no loess deposits *(15, 33)*.

Bedrock Geology

Preble County is covered by glacial drift with variable thicknesses. The bedrock is generally at a depth of more than 80 inches. However, the bedrock is shallow along the steep and very steep side slopes of the Four Mile Creek and Seven Mile Creek watersheds to the south. A few areas of exposed bedrock are visible along State Route 127 near the Butler County line and along State Route 725 near Camden. Two other areas of shallow bedrock occur along Twin Creek near Lewisburg and just south of West Alexandria. Small, isolated areas of shallow bedrock occur elsewhere *(28)*.

Bedrock in Preble County consists of Silurian-age limestone and interbedded limestone and calcareous shale of Ordovician age (fig. 4). Soils associated with the Silurian-age limestone include Millsdale, Milton, Plattville, and Randolph. The Ordovician bedrock mainly occurs in the southern one third of the county. It is

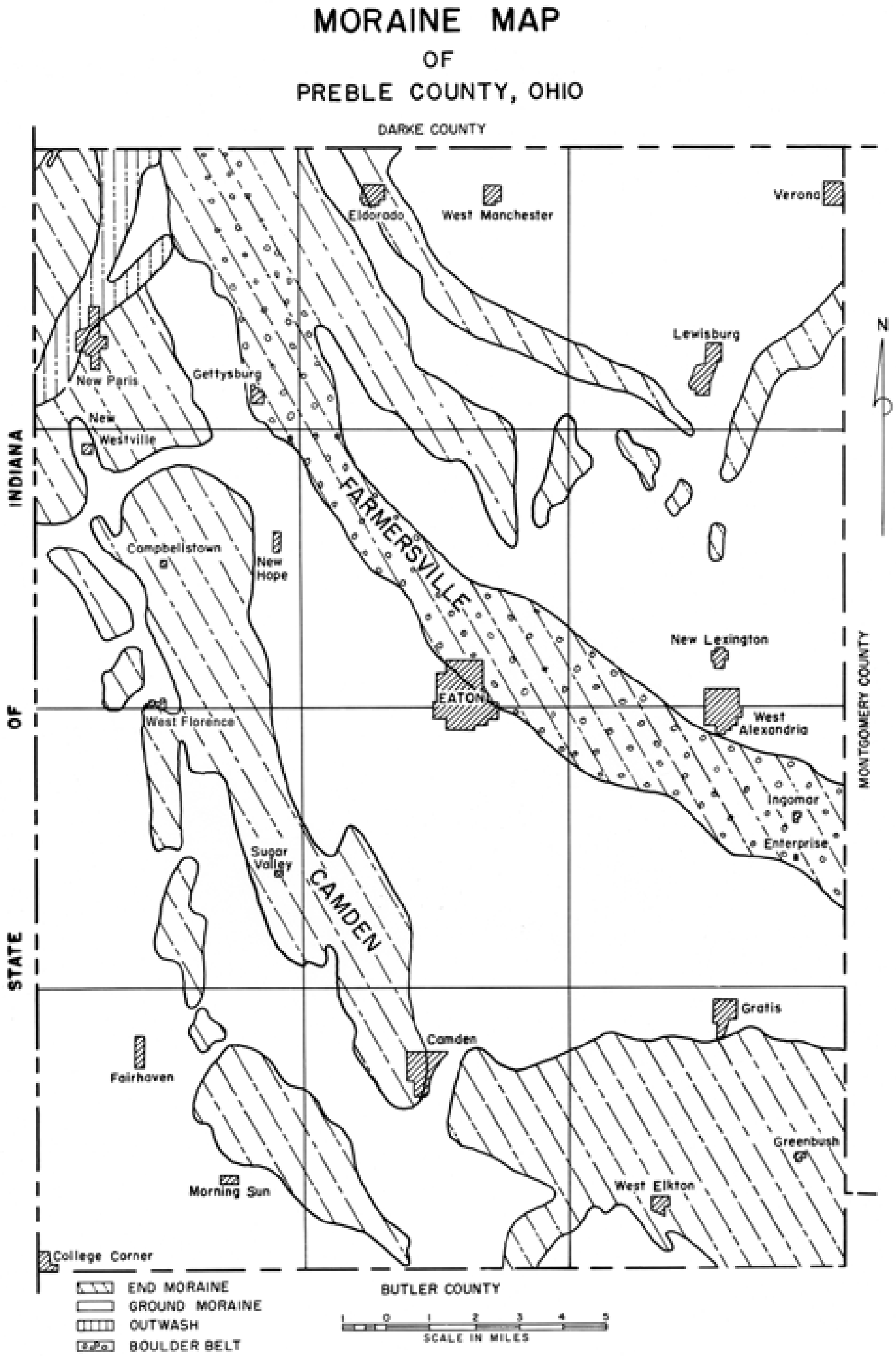


Figure 2.—Moraines of Preble County, Ohio.

characterized by thin, alternating layers of limestone and soft, calcareous, shale of the Richmond Formation. Wynn soils are associated with the Ordovician bedrock.

The remainder of the county is underlain by dolomitic limestone of the Niagara group of Silurian age. The highly crystalline Brassfield limestone underlies a narrow, irregular strip (also of Silurian age) extending from the southwestern part to the northeastern part of the county. This limestone lies between the Richmond and Niagara groups *(24)*.

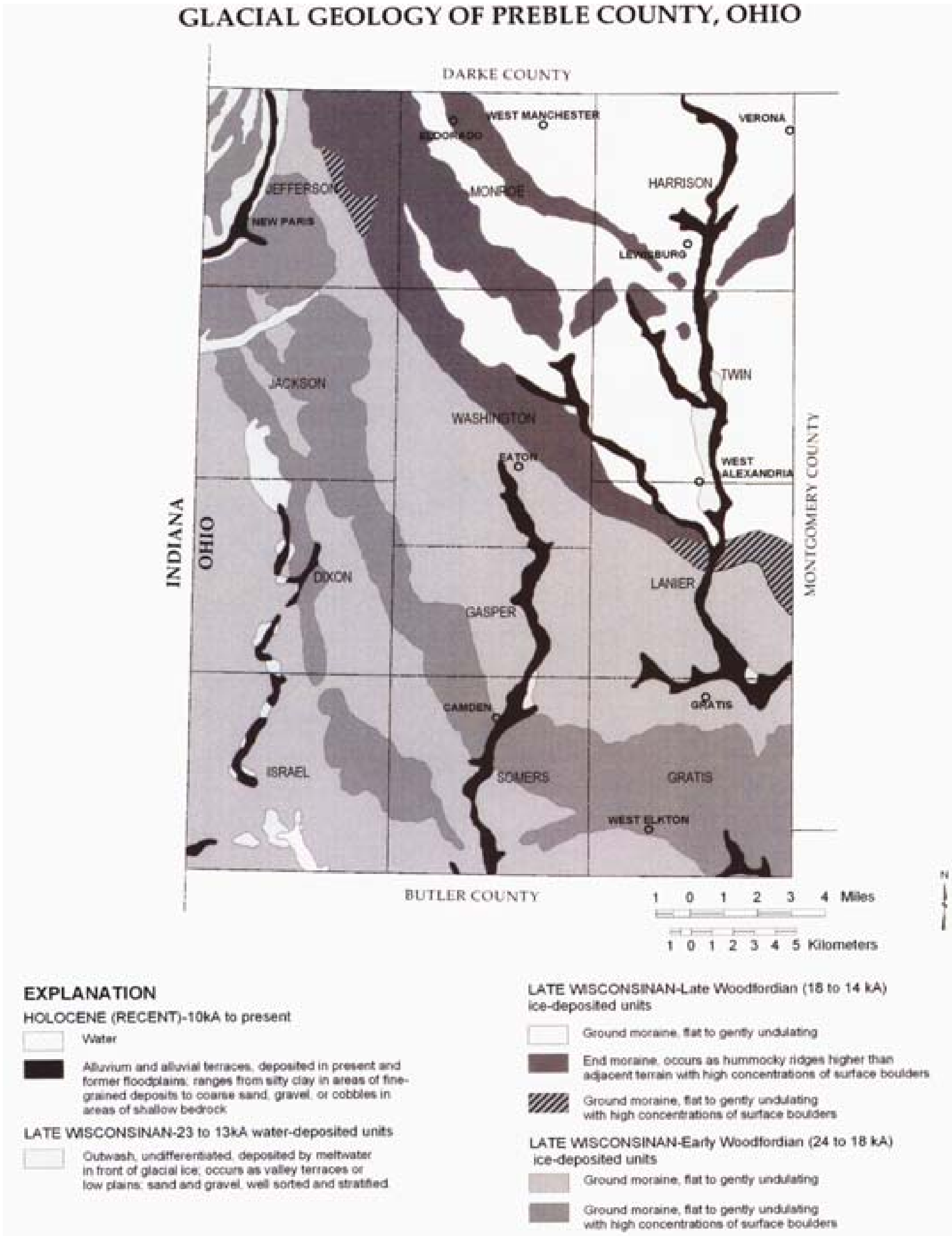


Figure 3.—Glacial geology of Preble County, Ohio.

Transportation

Preble County has a well developed network of roads, including seven state highways, three U.S. highways, and Interstate Highway 70. Preble County also has several hundred miles of paved county roads. The county is served by one east-west railroad. Air transportation is available at the nearby Greater Dayton Area International Airport, the Richmond Municipal Airport in Richmond, Indiana, the Hamilton Airport in Hamilton, and the Miami University Airfield near Oxford.

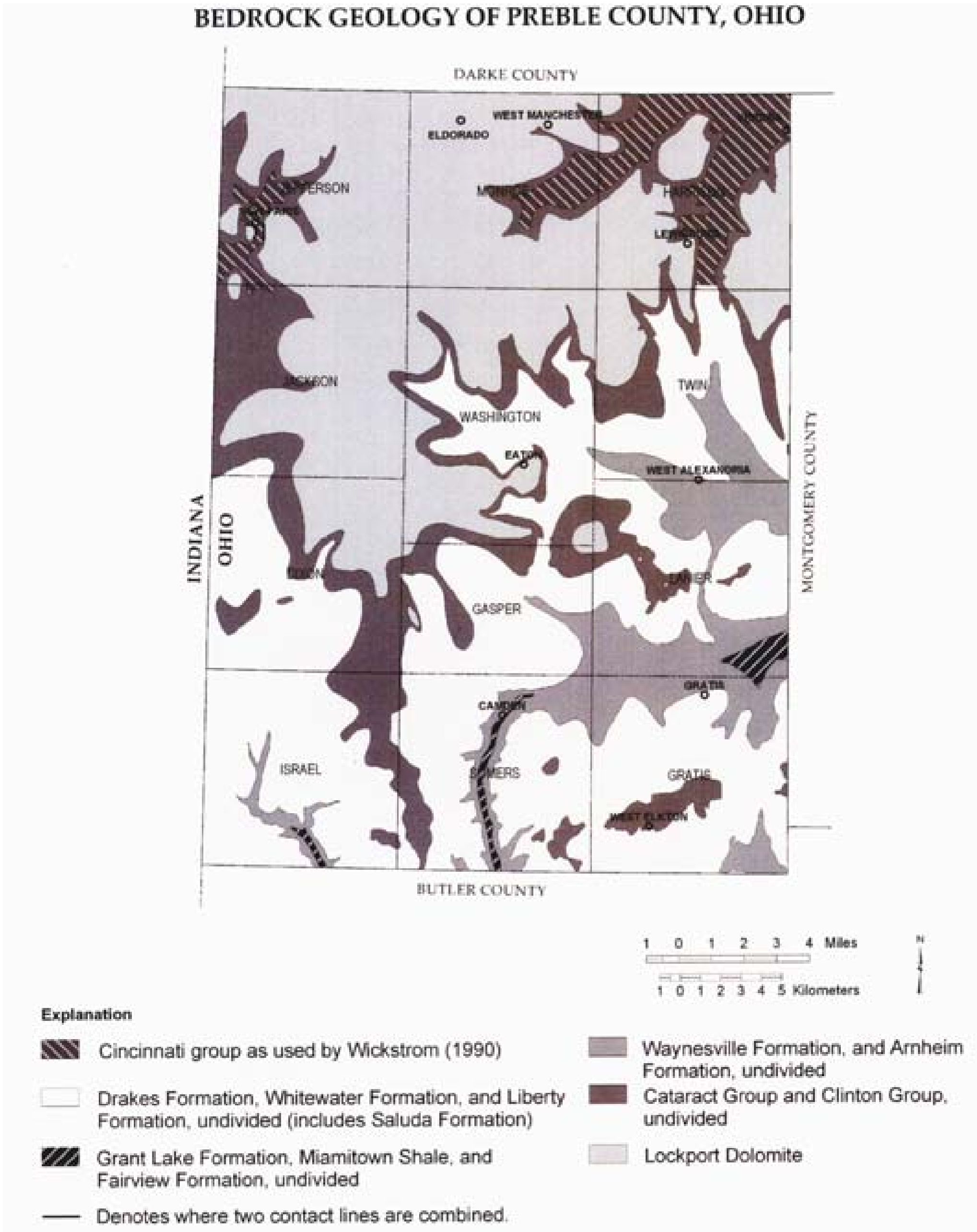


Figure 4.—Bedrock geology of Preble County, Ohio.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Eaton, Ohio, in the period 1971 to 2000. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on the length of the growing season.

In winter, the average temperature is 27.8 degrees F and the average daily minimum temperature is 18.7 degrees. The lowest temperature on record, which occurred at Eaton, Ohio, on January 19, 1994, was -33 degrees. In summer, the average temperature is 70.9 degrees and the average daily maximum temperature is

82.8 degrees. The highest temperature, which occurred at Eaton on July 16, 1988, was 102 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The average annual total precipitation is 39.58 inches. Of this, 18.26 inches, or about 46 percent, usually falls in May through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 4.28 inches, recorded at Eaton on May 18, 1991. Thunderstorms occur on about 42 days each year, and most occur between April and August.

The average seasonal snowfall is 10.0 inches. The greatest snow depth at any one time during the period of record was 20 inches, recorded on February 15, 1977. On average, 29 days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 11.0 inches, recorded on January 13, 1964.

The average relative humidity in mid-afternoon is about 70 percent in December and 50 percent in April and May. Humidity is higher at night, and the average at dawn is about 75 percent in April and 90 percent in August and September. The sun shines 63 percent of the time possible in summer and 40 percent in winter. The prevailing wind is from the south year-round. Average windspeed is highest, about 11 miles per hour, from January to April.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their

properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

Survey Procedures

This soil survey updates the survey of Preble County published in 1969 *(28)*. In 1991, at the request of the Preble County Commissioners, an evaluation of the 1969 survey was undertaken. Several areas were identified for modernization. The modernization included updating and expanding the interpretive tables, recorrelating the survey, updating soil classification, and remapping of a portion of the county.

The evaluation verified the accuracy of the majority of the line work on the maps. Primarily, these lines were used as a basis in producing the new maps. Transects were made to determine the validity of the map unit composition before these lines were transferred to the new photo base. In most cases no adjustments or only minor adjustments to soil lines were required.

The general procedures followed in making this survey are described in the “National Soil Survey Handbook” *(30)* and the “Soil Survey Manual” *(36)* of the Natural Resources Conservation Service.

Before actual fieldwork began, preliminary boundaries of slopes and landforms were studied from the aerial photographs flown in 1994 at a scale of 1:12,000. USGS

topographic maps at a scale of 1:12,000 were studied to relate land and image features.

Traverses were made on foot to examine the soils. In most areas, soil examinations along the traverses were made 10 to 50 yards apart, depending on the size of the units. Observations of such features as landforms, trees blown down, vegetation, roadbanks, and animal burrows were made continuously without regard to spacing. Soil boundaries were confirmed or adjusted on the basis of soil examinations, observations, and photo interpretation. The soil material was examined with the aid of a hand auger or spade to a depth of about 80 inches or to bedrock if the bedrock was at a depth of less than 80 inches. The pedons described as typical were observed and studied in pits.

Soil mapping changes were recorded on the field sheets from the 1969 soil survey. The drainageways were mapped in the field and from the old field sheets and USGS topographic maps. Cultural features were recorded from visual observations and topographic maps.

Samples for chemical analyses, physical analyses, and engineering properties were taken from representative sites for several of the soils in the survey area. The chemical and physical analyses were made by the Soil Characterization Laboratory, Ohio State University, Columbus, Ohio. The results of the analyses are stored in a computerized data file at the laboratory. The analyses for engineering properties were made by the Ohio Department of Transportation, Division of Highways, Bureau of Testing, Soils and Foundation Section, Columbus, Ohio. The laboratory procedures can be obtained by request from these respective laboratories. The results of laboratory analyses can be obtained from the Soil Characterization Laboratory, Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

General Soil Map Units

The general soil map shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Some soil boundaries and soil names in this survey area do not fully match those in adjacent survey areas that were published at an earlier date. Differences are the result of changes and refinements in soil series concepts, updated soil taxonomy, slightly different map unit composition in survey areas, and the use of the State Soil Geographic data (STATSGO) map as the base for the general soil map in this publication.

1. Fincastle-Cyclone-Xenia

Very deep, nearly level and gently sloping, somewhat poorly drained, poorly drained, and moderately well drained soils that formed in loess and the underlying till

Setting

Landform: Wisconsinan till plains
Slope range: 0 to 6 percent

Composition

Extent of the map unit in the county: 1 percent
Extent of the components in the map unit:
Fincastle soils—35 percent
Cyclone soils—30 percent
Xenia soils—30 percent
Minor soils—5 percent

Soil Properties and Qualities

Fincastle

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: Loess and the underlying till

Surface textural class: Silt loam
Slope range: 0 to 2 percent

Cyclone

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope range: 0 to 2 percent

Xenia

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope range: 0 to 6 percent

Minor Soils

- Miamian soils on shoulders and backslopes

Use and Management

Major uses: Cropland
Management concerns: Ponding, seasonal high water table, compaction, frost action, surface crusting, erosion hazard, ground-water pollution, tilth, and slope

2. Xenia-Miamian-Fincastle

Very deep, nearly level to steep, moderately well drained, well drained, and somewhat poorly drained soils that formed in loess and the underlying till or entirely in till

Setting

Landform: Wisconsinan till plains
Slope range: 0 to 50 percent

Composition

Extent of the map unit in the county: 6.5 percent
Extent of the components in the map unit:
Xenia soils—40 percent
Miamian soils—20 percent
Fincastle soils—15 percent
Minor soils—25 percent

Soil Properties and Qualities

Xenia

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope range: 0 to 6 percent

Miamian

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Summits, shoulders, and backslopes
Parent material: A thin layer of loess and the underlying till or entirely till
Surface textural class: Silt loam or clay loam
Slope range: 2 to 50 percent

Fincastle

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: Loess and the underlying till
Surface textural class: Silt loam
Slope range: 0 to 2 percent

Minor Soils

- Cyclone soils in depressional areas
- Russell soils on summits and shoulders
- Eel soils on flood plains
- Hennepin soils on backslopes

Use and Management

Major uses: Cropland
Management concerns: Erosion hazard, root-restrictive layer, surface crusting, compaction, seasonal high water table, tilth, slope, frost action, and available water capacity

3. Cyclone-Sugarvalley-Morningsun

Very deep, nearly level and gently sloping, poorly drained, somewhat poorly drained, and moderately well drained soils that formed in loess and the underlying till or water-modified till (fig. 5)

Setting

Landform: Wisconsinan till plains and ground moraines
Slope range: 0 to 6 percent

Composition

Extent of the map unit in the county: 4.5 percent
Extent of the components in the map unit:
Cyclone soils—50 percent
Sugarvalley soils—30 percent
Morningsun soils—15 percent
Minor soils—5 percent

Soil Properties and Qualities

Cyclone

Depth class: Very deep
Drainage class: Poorly drained
Parent material: Loess and the underlying till

Figure 5.—Typical pattern of soils in the Cyclone-Sugarvalley-Morningsun general soil map unit. The Cyclone soils are in the low-lying, dark-colored areas, and the Sugarvalley and Morningsun soils are in the slightly higher-lying, light-colored areas.

Surface textural class: Silt loam
Slope range: 0 to 2 percent

Sugarvalley

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits
Parent material: Loess and the underlying water-modified till
Surface textural class: Silt loam
Slope range: 0 to 2 percent

Morningsun

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits
Parent material: Loess and the underlying water-modified till
Surface textural class: Silt loam
Slope range: 0 to 6 percent

Minor Soils

- Xenia soils on summits and shoulders
- Fincastle soils on summits

Use and Management

Major uses: Cropland
Management concerns: Compaction, seasonal high water table, ponding, frost action, ground-water pollution, surface crusting, erosion hazard, slope, and tilth

4. Celina-Miamian-Kokomo

Very deep, level to steep, moderately well drained, well drained, and very poorly drained soils that formed in loess and the underlying till, entirely in till, or in loamy material and the underlying till (fig. 6)

Setting

Landform: Wisconsinan till plains
Slope range: 0 to 50 percent

Composition

Extent of the map unit in the county: 49 percent
Extent of the components in the map unit:
Celina soils—40 percent
Miamian soils—30 percent
Kokomo soils—15 percent
Minor soils—15 percent

Soil Properties and Qualities

Celina

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: A thin layer of loess and the underlying till
Surface textural class: Silt loam
Slope range: 0 to 6 percent

Miamian

Depth class: Very deep
Drainage class: Well drained

Figure 6.—Typical pattern of soils in the Celina-Miamian-Kokomo general soil map unit. The Celina soils are in the light-colored areas in the foreground; the more sloping Miamian soils are in the background; and the Kokomo soils are in the low-lying, dark-colored areas in the center.

Position on the landform: Summits, shoulders, and backslopes
Parent material: A thin layer of loess and the underlying till or entirely till
Surface textural class: Silt loam or clay loam
Slope range: 2 to 50 percent

Kokomo

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy material and the underlying till
Surface textural class: Silt loam or silty clay loam
Slope range: 0 to 1 percent

Minor Soils

- Crosby soils on summits
- Westland soils on treads
- Medway soils on flood plains

Use and Management

Major uses: Cropland
Management concerns: Seasonal high water table, ponding, compaction, surface crusting, available water capacity, erosion hazard, slope, tilth, frost action, root-restrictive layer, restricted permeability, and ground-water pollution

5. Kokomo-Crosby-Celina

Very deep, level to gently sloping, very poorly drained, somewhat poorly drained, and moderately well drained soils that formed in loamy material and the underlying till or in loess and the underlying till (fig. 7)

Setting

Landform: Wisconsinan till plains
Slope range: 0 to 6 percent

Composition

Extent of the map unit in the county: 28 percent
Extent of the components in the map unit:
Kokomo soils—45 percent
Crosby soils—25 percent
Celina soils—20 percent
Minor soils—10 percent

Soil Properties and Qualities

Kokomo

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy material and the underlying till
Surface textural class: Silt loam or silty clay loam
Slope range: 0 to 1 percent

Crosby

Depth class: Very deep
Drainage class: Somewhat poorly drained
Position on the landform: Summits

Figure 7.—Typical pattern of soils in the Kokomo-Crosby-Celina general soil map unit. The Kokomo soils are in the low-lying, dark colored areas in the foreground; the slightly higher-lying Crosby soils are in the center; and the more sloping Celina soils are in the background.

Parent material: A thin layer of loess and the underlying till
Surface textural class: Silt loam
Slope range: 0 to 4 percent

Celina

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Summits and shoulders
Parent material: Loess and the underlying till
Surface textural class: Silt loam or clay loam
Slope range: 0 to 6 percent

Minor Soils

- Miamian soils on summits, shoulders, and footslopes
- Lewisburg soils on summits and shoulders

Use and Management

Major uses: Cropland
Management concerns: Seasonal high water table, ponding, compaction, ground-water pollution, root-restrictive layer, surface crusting, erosion hazard, available water capacity, high clay content, restricted permeability, slope, frost action, and tilth

6. Miami-Kendallville

Very deep, gently sloping to steep, well drained and moderately well drained soils that formed in loess and the underlying outwash and/or till or that formed entirely in till

Setting

Landform: Wisconsinan kames and moraines
Slope range: 2 to 50 percent

Composition

Extent of the map unit in the county: 2 percent
Extent of the components in the map unit:
Miami soils—65 percent
Kendallville soils—25 percent
Minor soils—10 percent

Soil Properties and Qualities

Miami

Depth class: Very deep
Drainage class: Moderately well drained
Position on the landform: Shoulders and backslopes
Parent material: A thin layer of loess and the underlying till or entirely till
Surface textural class: Silt loam or loam
Slope range: 2 to 50 percent

Kendallville

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Shoulders and backslopes
Parent material: A thin layer of loess and the underlying outwash and till
Surface textural class: Silt loam or loam
Slope range: 6 to 50 percent

Minor Soils

- Crosby soils on summits
- Eldean soils on shoulders, footslopes, and backslopes
- Rainsville soils on summits
- Rodman soils on backslopes

Use and Management

Major uses: Woodland and pasture
Management concerns: Surface crusting, easily eroded soil material, slope, compaction, root-restrictive layer, tilth, and available water capacity

7. Eldean-Lippincott

Very deep, nearly level to moderately steep, well drained and very poorly drained soils that formed in outwash or in silty material and the underlying outwash

Setting

Landform: Wisconsinan outwash terraces
Slope range: 0 to 18 percent

Composition

Extent of the map unit in the county: 0.5 percent
Extent of the components in the map unit:
Eldean soils—40 percent
Lippincott soils—40 percent
Minor soils—20 percent

Soil Properties and Qualities

Eldean

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Treads and risers
Parent material: Outwash
Surface textural class: Loam, silt loam, gravelly loam, or gravelly clay loam
Slope range: 0 to 18 percent

Lippincott

Depth class: Very deep
Drainage class: Very poorly drained
Position on the landform: Treads
Parent material: Silty material and the underlying outwash
Surface textural class: Silty clay loam
Slope range: 0 to 2 percent

Minor Soils

- Kendallville soils on backslopes
- Savona soils on treads
- Sloan soils on flood plains

Use and Management

Major uses: Cropland
Management concerns: Ground-water pollution, seasonal high water table, ponding, compaction, available water capacity, root-restrictive layer, high clay content, frost action, erosion hazard, slope, and tilth

8. Eldean-Stonelick-Rossburg

Very deep, level to moderately steep, well drained soils that formed in outwash or alluvium

Setting

Landform: Wisconsinan outwash plains and flood plains
Slope range: 0 to 18 percent

Composition

Extent of the map unit in the county: 8.5 percent
Extent of the components in the map unit:
Eldean soils—40 percent
Stonelick soils—25 percent
Rossburg soils—20 percent
Minor soils—15 percent

Soil Properties and Qualities

Eldean

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Treads and risers
Parent material: Outwash

Surface textural class: Loam, silt loam, gravelly loam, or gravelly clay loam
Slope range: 0 to 18 percent

Stonelick

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Flood plains
Parent material: Alluvium
Surface textural class: Loam
Slope range: 0 to 1 percent

Rossburg

Depth class: Very deep
Drainage class: Well drained
Position on the landform: Flood plains
Parent material: Alluvium
Surface textural class: Silt loam
Slope range: 0 to 1 percent

Minor Soils

- Ockley soils on treads
- Sloan soils on flood plains

Use and Management

Major uses: Cropland
Management concerns: Root-restrictive layer, erosion hazard, available water capacity, flooding, ground-water pollution, compaction, high clay content, slope, and tilth

Detailed Soil Map Units

The map units delineated on the detailed soil maps represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

The detailed map unit descriptions list management statements for most major uses of the soils: cropland, pastureland, woodland, building sites, septic tank absorption fields, and local roads and streets. The management statements listed for a particular map unit address the most limiting features of that soil for a certain use. Some management statements suggest specific measures that may help alleviate the effects of these limiting soil features. The mention of such management measures is not a recommendation, especially where current laws or programs may prohibit an activity, such as the installation of drainage systems. Even the best management practices cannot overcome some limitations of the soil.

An identifying symbol precedes the map unit name in the map unit descriptions.

Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Miamian silt loam, 6 to 12 percent slopes, eroded, is a phase of the Miamian series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Crosby-Lewisburg silt loams, 0 to 2 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, gravel, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Figures 8a and 8b show the relationship between different geomorphic slope positions and slope terminology *(22, 23)*. In areas of low relief in Preble County, slope position terms generally were not used. Refer to the Glossary for more detailed definitions of these landform components.

CeA—Celina silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

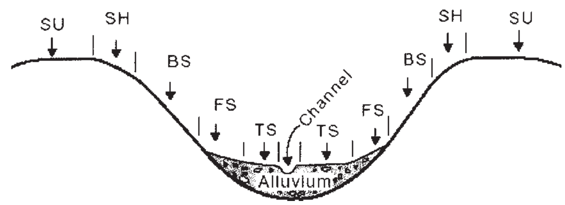
Map Unit Composition

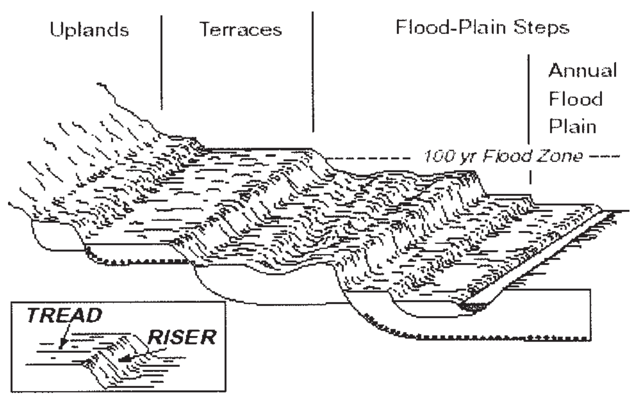
Celina soil and similar components: 85 percent
Contrasting components:
  Crosby soils—10 percent
  Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: About 6.8 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow

Position	Code
summit	SU
shoulder	SH
backslope	BS
footslope	FS
toeslope	TS





Figures 8a and 8b

Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.

- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

CeB—Celina silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Celina soil and similar components: 85 percent

Contrasting components:
- Crosby soils—10 percent
- Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: About 7.2 inches to a depth of 38 inches
Cation-exchange capacity of the surface layer: 9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Because of the seasonal high water table, the period when excavations can be

made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

CeB2—Celina silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Celina soil and similar components: 85 percent
Contrasting components:
  Crosby soils—10 percent
  Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.3 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 16 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained

Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site

development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

CoA—Corwin silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Corwin soil and similar components: 90 percent
Contrasting components:
  Kokomo soils—5 percent
  Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 38 inches
Cation-exchange capacity of the surface layer: 10 to 24 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent

Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- This soil is well suited to pasture.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, because of the dense nature of the subsurface layer, the difficulty of digging and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

CtA—Crosby-Celina silt loams, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Crosby soil and similar components: 60 percent
Celina soil and similar components: 30 percent
Contrasting components:
Kokomo soils—10 percent

Soil Properties and Qualities

Available water capacity: Crosby—about 5.3 inches to a depth of 39 inches; Celina—about 6.4 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: Crosby—6.0 to 20 meq per 100 grams; Celina—9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Crosby—0.5 foot to 1.5 feet; Celina—1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Crosby—somewhat poorly drained; Celina—moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Crosby—very slow or slow; Celina—very slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

- In areas of the Crosby soil, the movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table in areas of the Crosby soil.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the Crosby soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- In areas of the Crosby soil, including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.
- In areas of the Crosby soil, the rooting depth of crops is restricted by dense soil material and a high clay content.
- In areas of the Celina soil, the rooting depth of crops is restricted by dense soil material.

Pastureland

- The root systems of plants may be damaged by frost action.
- In areas of the Crosby soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture in areas of the Crosby soil.
- The Crosby soil provides poor summer pasture.
- In areas of the Crosby soil, excess water should be removed from the pasture or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction in areas of the Crosby soil.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A seasonal high water table in areas of the Crosby soil can inhibit the growth of some species of seedlings by reducing root respiration.
- Soil wetness may limit the use of log trucks in areas of the Crosby soil.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted in areas of the Celina soil to the drier periods.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas of the Crosby soil, because of the dense nature of the subsurface layer, the difficulty of digging and compacting the soil material in shallow excavations is increased.

- In some areas of the Crosby soil, because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted soil permeability limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: Crosby—C-1; Celina—A-6
Hydric soils: No

CtB—Crosby-Celina silt loams, 2 to 4 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Crosby soil and similar components: 50 percent
Celina soil and similar components: 40 percent
Contrasting components:
Kokomo soils—10 percent

Soil Properties and Qualities

Available water capacity: Crosby—about 4.3 inches to a depth of 32 inches; Celina—about 7.4 inches to a depth of 39 inches
Cation-exchange capacity of the surface layer: Crosby—6.0 to 20 meq per 100 grams; Celina—9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Crosby—0.5 foot to 1.5 feet; Celina—1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Crosby—somewhat poorly drained; Celina—moderately well drained
Flooding: None

Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Crosby—very slow or slow; Celina—very slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by dense soil material and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the Crosby soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- In areas of the Crosby soil, the movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table in areas of the Crosby soil.
- In areas of the Crosby soil, including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.
- In areas of the Crosby soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture in areas of the Crosby soil.
- The Crosby soil provides poor summer pasture.
- In areas of the Crosby soil, excess water should be removed from the pasture or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction in areas of the Crosby soil.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Soil wetness may limit the use of log trucks in areas of the Crosby soil.
- A seasonal high water table in areas of the Crosby soil can inhibit the growth of some species of seedlings by reducing root respiration.
- Because of the stickiness of the soil, the use of equipment for site preparation in areas of the Celina soil is restricted to the drier periods.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas of the Crosby soil, because of the dense nature of the subsurface layer, the difficulty of digging and compacting the soil material in shallow excavations is increased.
- In some areas of the Crosby soil, because of the high content of clay in the subsurface layer, the difficulty of digging, filling, and compacting the soil material in shallow excavations is increased.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: Crosby—C-1; Celina—A-6
Hydric soils: No

CvA—Crosby-Lewisburg silt loams, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Crosby soil and similar components: 60 percent
Lewisburg soil and similar components: 30 percent
Contrasting components:
Kokomo soils—10 percent

Soil Properties and Qualities

Available water capacity: Crosby—about 5.2 inches to a depth of 36 inches; Lewisburg—about 3.1 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: Crosby—6.0 to 20 meq per 100 grams; Lewisburg—9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Crosby—dense material at a depth of 20 to 40 inches; Lewisburg—dense material at a depth of 10 to 20 inches
Depth to the top of the seasonal high water table: Crosby—0.5 foot to 1.5 feet; Lewisburg—0.5 foot to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Crosby—somewhat poorly drained; Lewisburg—moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Crosby—a thin layer of loess and the underlying till; Lewisburg—basal till
Permeability: Crosby—very slow or slow; Lewisburg—slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Crosby—medium; Lewisburg—high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- In areas of the Crosby soil, including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.
- In areas of the Crosby soil, the movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- In areas of the Crosby soil, the rooting depth of crops is restricted by dense soil material and a high clay content.
- In areas of the Lewisburg soil, the rooting depth of crops is restricted by dense soil material.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.
- The root systems of plants may be damaged by frost action.
- In areas of the Crosby soil, excess water should be removed from the pasture or grass or legume species that are adapted to wet soil conditions should be planted.
- Restricting grazing during wet periods can minimize compaction in areas of the Crosby soil.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A seasonal high water table in areas of the Crosby soil can inhibit the growth of some species of seedlings by reducing root respiration.
- Because of the stickiness of the soil, the use of equipment for site preparation in areas of the Lewisburg soil is restricted to the drier periods.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the Crosby soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Because of shrinking and swelling, the Crosby soil may not be suitable for use as base material for local roads and streets.
- The Crosby soil has a low bearing strength, which is generally unfavorable for

Figure 9.—Typical setting of Cyclone silt loam, 0 to 2 percent slopes.

supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

- In areas of the Lewisburg soil, special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: Crosby—C-1; Lewisburg—A-6
Hydric soils: No

CyA—Cyclone silt loam, 0 to 2 percent slopes

Setting

Landform: Flats and depressions on the Wisconsinan till plains (fig. 9)

Map Unit Composition

Cyclone soil and similar components: 85 percent
Contrasting components:
  Fincastle soils—5 percent
  Xenia soils—5 percent
  Sugarvalley soils—3 percent
  Morningsun soils—2 percent

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 15 to 27 meq per 100 grams

Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 foot
Drainage class: Poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Loess and the underlying till
Permeability: Moderately slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

DaA—Dana silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Dana soil and similar components: 90 percent
Contrasting components:
    Cyclone soils—5 percent
    Fincastle soils—5 percent

Soil Properties and Qualities

Available water capacity: About 10.6 inches to a depth of 55 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 70 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Loess and the underlying till
Permeability: Slow or moderately slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

DaB—Dana silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Dana soil and similar components: 90 percent
Contrasting components:
Cyclone soils—5 percent
Fincastle soils—5 percent

Soil Properties and Qualities

Available water capacity: About 10.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 70 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 5.0 percent
Parent material: Loess and the underlying till
Permeability: Slow or moderately slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

EeA—Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded

Setting

Landform: Flood plains

Map Unit Composition

Eel soil and similar components: 85 percent
Contrasting components:
  Rossburg soils—5 percent
  Sloan soils—5 percent
  Stonelick soils—5 percent

Soil Properties and Qualities

Available water capacity: About 10.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 1.5 to 2.0 feet
Water table kind: Apparent

Ponding: None
Drainage class: Moderately well drained
Flooding: Occasional
Organic matter content in the surface layer: 2.0 to 3.0 percent
Parent material: Recent alluvium
Permeability: Moderate in the solum and rapid in the gravelly substratum
Potential for frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of log trucks.
- Flooding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuitable as homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent the damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Interpretive Groups

Land capability classification: 2w
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-5
Hydric soil: No

EgA—Eldean gravelly loam, 0 to 2 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Eldean soil and similar components: 90 percent
Contrasting components:
 Ockley soils—5 percent
 Warsaw soils—5 percent

Soil Properties and Qualities

Available water capacity: About 3.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.

- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2s
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

EgB—Eldean gravelly loam, 2 to 6 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Eldean soil and similar components: 90 percent
Contrasting components:
Ockley soils—10 percent

Soil Properties and Qualities

Available water capacity: About 3.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

EgB2—Eldean gravelly loam, 2 to 6 percent slopes, eroded

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Eldean soil and similar components: 90 percent
Contrasting components:
    Ockley soils—10 percent

Soil Properties and Qualities

Available water capacity: About 3.1 inches to a depth of 26 inches

Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

EhC3—Eldean gravelly clay loam, 6 to 12 percent slopes, severely eroded

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Risers

Map Unit Composition

Eldean soil and similar components: 85 percent
Contrasting components:
Rodman soils—10 percent
Ockley soils—5 percent

Soil Properties and Qualities

Available water capacity: About 2.7 inches to a depth of 22 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly clay loam

Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

EhD3—Eldean gravelly clay loam, 12 to 18 percent slopes, severely eroded

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Risers

Map Unit Composition

Eldean soil and similar components: 85 percent
Contrasting components:
Rodman soils—10 percent
Ockley soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.2 inches to a depth of 35 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Gravelly clay loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases

the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

EkA—Eldean loam, 0 to 2 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Eldean soil and similar components: 90 percent
Contrasting components:
Ockley soils—5 percent
Warsaw soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.8 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases

the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2s
Prime farmland: All areas are prime farmland

Pasture and hayland suitability group: B-1
Hydric soil: No

EkB—Eldean loam, 2 to 6 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Eldean soil and similar components: 90 percent
Contrasting components:
Ockley soils—10 percent

Soil Properties and Qualities

Available water capacity: About 4.4 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

EkB2—Eldean loam, 2 to 6 percent slopes, eroded

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Eldean soil and similar components: 90 percent
Contrasting components:
Ockley soils—10 percent

Soil Properties and Qualities

Available water capacity: About 4.0 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Outwash
Permeability: Moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

FcA—Fincastle silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Fincastle soil and similar components: 95 percent
Contrasting components:
Cyclone soils—5 percent

Soil Properties and Qualities

Available water capacity: About 8.9 inches to a depth of 46 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: 0.5 foot to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and

basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: No

FdA—Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Fincastle soil and similar components: 85 percent
Contrasting components:
Wynn soils—10 percent
Cyclone soils—5 percent

Soil Properties and Qualities

Available water capacity: About 8.4 inches to a depth of 43 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Deep or very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 60 inches; bedrock (paralithic) at a depth of 55 to 65 inches
Depth to the top of the seasonal high water table: 0.5 foot to 1.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Somewhat poorly drained

Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till over limestone and shale
Permeability: Slow in the till substratum and slow to impermeable in the underlying bedrock
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of properly installing the effluent distribution lines.

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: No

FmA—Fox silt loam, till substratum, 0 to 2 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Fox soil and similar components: 90 percent
Contrasting components:
Ockley soils—5 percent
Westland soils—5 percent

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 37 inches
Cation-exchange capacity of the surface layer: 4.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 24 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
Permeability: Moderate in the loamy material, rapid or very rapid in the outwash, and slow in the till
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam

Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- This soil is well suited to pasture.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2s
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

FmB—Fox silt loam, till substratum, 2 to 6 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Fox soil and similar components: 90 percent
Contrasting components:
Ockley soils—5 percent
Westland soils—5 percent

Soil Properties and Qualities

Available water capacity: About 6.1 inches to a depth of 37 inches
Cation-exchange capacity of the surface layer: 4.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 24 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
Permeability: Moderate in the loamy material, rapid or very rapid in the outwash, and slow in the till
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.

- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

FmB2—Fox silt loam, till substratum, 2 to 6 percent slopes, eroded

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Fox soil and similar components: 90 percent
Contrasting components:
Ockley soils—5 percent
Westland soils—5 percent

Soil Properties and Qualities

Available water capacity: About 6.2 inches to a depth of 38 inches
Cation-exchange capacity of the surface layer: 2.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 24 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet

Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
Permeability: Moderate in the loamy material, rapid or very rapid in the outwash, and slow in the till
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic

Figure 10.—Typical setting of Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded.

systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

HeF2—Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded

Setting

Landform: Wisconsinan till plains (fig. 10)
Position on the landform: Backslopes

Map Unit Composition

Hennepin soil and similar components: 55 percent
Miamian soil and similar components: 45 percent

Soil Properties and Qualities

Available water capacity: Hennepin—about 2.4 inches to a depth of 16 inches; Miamian—about 5.1 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: Hennepin—14 to 20 meq per 100 grams; Miamian—10 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Hennepin—dense material at a depth of 10 to 20 inches; Miamian—dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Hennepin—more than 6 feet; Miamian—2.5 to 3.5 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: Hennepin—0.5 to 2.0 percent; Miamian—0.8 to 2.2 percent
Parent material: Hennepin—basal till; Miamian—a thin layer of loess and the underlying till
Permeability: Slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- These soils are generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- Because of the slope, the use of equipment to prepare sites for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The high content of lime in the upper part of the Hennepin soil may cause a nutrient imbalance in seedlings.
- In areas of the Hennepin soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Because of the content of clay, the Miamian soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miamian soil, because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table of the Miamian soil greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- Special design of roads and streets is needed in areas of the Miamian soil to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 7e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-3
Hydric soils: No

HwE2—Hennepin-Wynn silt loams, 18 to 25 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Hennepin—backslopes; Wynn—footslopes

Map Unit Composition

Hennepin soil and similar components: 55 percent
Wynn soil and similar components: 40 percent
Contrasting components:
Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: Hennepin—about 2.4 inches to a depth of 16 inches; Wynn—about 5.6 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: Hennepin—14 to 20 meq per 100 grams; Wynn—9.0 to 22 meq per 100 grams

Depth class: Hennepin—very deep; Wynn—moderately deep
Depth to root-restrictive feature: Hennepin—dense material at a depth of 10 to 20 inches; Wynn—bedrock (paralithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Hennepin—more than 6 feet; Wynn—more than 2.5 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: Hennepin—0.5 to 2.0 percent; Wynn—0.8 to 2.2 percent
Parent material: Hennepin—basal till; Wynn—a thin layer of loess and the underlying till over limestone and shale
Permeability: Hennepin—slow; Wynn—moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.
- In areas of the Wynn soil, the rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.
- In areas of the Hennepin soil, the high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.

- In areas of the Wynn soil, bedrock may interfere with the construction of haul roads and log landing sites.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas of the Hennepin soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- The moderate shrinking and swelling of the Wynn soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in the Wynn soil reduces the ease of excavation and increases the difficulty of constructing foundations and installing utilities.

Septic tank absorption fields

- The restricted permeability of the Hennepin soil limits the absorption and proper treatment of the effluent from septic systems.
- In areas of the Hennepin soil, because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- Because of the limited depth to bedrock, the Wynn soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Wynn soil may not be suitable for use as base material for local roads and streets.
- The Wynn soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Hennepin—A-2; Wynn—F-1
Hydric soils: No

HwF2—Hennepin-Wynn silt loams, 25 to 50 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Hennepin—backslopes; Wynn—footslopes

Map Unit Composition

Hennepin soil and similar components: 55 percent

Wynn soil and similar components: 40 percent
Contrasting components:
Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: Hennepin—about 1.9 inches to a depth of 13 inches; Wynn—about 4.5 inches to a depth of 24 inches
Cation-exchange capacity of the surface layer: Hennepin—14 to 20 meq per 100 grams; Wynn—9.0 to 22 meq per 100 grams
Depth class: Hennepin—very deep; Wynn—moderately deep
Depth to root-restrictive feature: Hennepin—dense material at a depth of 10 to 20 inches; Wynn—bedrock (paralithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Hennepin—more than 6 feet; Wynn—more than 2.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: Hennepin—0.5 to 2.0 percent; Wynn—0.8 to 2.2 percent
Parent material: Hennepin—basal till; Wynn—a thin layer of loess and the underlying till over limestone and shale
Permeability: Hennepin—slow; Wynn—moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- These soils are generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- Because of the slope, the use of equipment to prepare sites for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

- In areas of the Hennepin soil, the high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas of the Hennepin soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- The moderate shrinking and swelling of the Wynn soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in the Wynn soil reduces the ease of excavation and increases the difficulty of constructing foundations and installing utilities.

Septic tank absorption fields

- The restricted permeability of the Hennepin soil limits the absorption and proper treatment of the effluent from septic systems.
- In areas of the Hennepin soil, because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- Because of the limited depth to bedrock, the Wynn soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Wynn soil may not be suitable for use as base material for local roads and streets.
- The Wynn soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 7e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Hennepin—A-3; Wynn—F-2
Hydric soils: No

KeC2—Kendallville-Eldean silt loams, 6 to 12 percent slopes, eroded

Setting

Landform: Kames and outwash terraces
Position on the landform: Shoulders and risers

Map Unit Composition

Kendallville soil and similar components: 60 percent
Eldean soil and similar components: 30 percent

Contrasting components:
Fox soils—5 percent
Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: Kendallville—about 4.5 inches to a depth of 30 inches; Eldean—about 3.3 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: Kendallville—4.0 to 18 meq per 100 grams; Eldean—8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Kendallville—dense material at a depth of 20 to 40 inches; Eldean—strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Kendallville—a thin layer of loess and the underlying outwash and till; Eldean—outwash
Permeability: Kendallville—moderately slow; Eldean—moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Kendallville soil, the rooting depth of crops is restricted by dense soil material.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination in areas of the Eldean soil.
- In areas of the Eldean soil, the rooting depth of crops may be restricted by the high clay content.
- In areas of the Eldean soil, the rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- Burning may destroy organic matter.
- In areas of the Kendallville soil, rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the Eldean soil reduces the efficiency of mechanical planting equipment.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas of the Kendallville soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Eldean soil, because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of the Eldean soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Kendallville—A-1; Eldean—B-1
Hydric soils: No

KeD2—Kendallville-Eldean silt loams, 12 to 18 percent slopes, eroded

Setting

Landform: Kames and outwash terraces
Position on the landform: Backslopes and risers

Map Unit Composition

Kendallville soil and similar components: 50 percent
Eldean soil and similar components: 30 percent
Contrasting components:
Miamian soils—10 percent
Fox soils—5 percent
Rodman soils—5 percent

Soil Properties and Qualities

Available water capacity: Kendallville—about 4.7 inches to a depth of 32 inches; Eldean—about 4.0 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: Kendallville—4.0 to 18 meq per 100 grams; Eldean—8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Kendallville—dense material at a depth of 20 to 40 inches; Eldean—strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Kendallville—a thin layer of loess and the underlying outwash and till; Eldean—outwash
Permeability: Kendallville—moderately slow; Eldean—moderately slow or moderate in the solum and rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Kendallville soil, the rooting depth of crops is restricted by dense soil material.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination in areas of the Eldean soil.
- In areas of the Eldean soil, the rooting depth of crops may be restricted by the high clay content.
- In areas of the Eldean soil, the rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- In areas of the Kendallville soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Rock fragments in the Kendallville soil obstruct the use of mechanical planting equipment.
- The stickiness of the Eldean soil reduces the efficiency of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas of the Kendallville soil, the dense nature of the subsurface layer

increases the difficulty of digging and compacting the soil material in shallow excavations.
- Because of the high content of sand or gravel in the Eldean soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The excessive permeability limits the proper treatment of the effluent from septic systems in areas of the Eldean soil. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Kendallville—A-1; Eldean—B-1
Hydric soils: No

KnA—Kokomo silt loam, 0 to 1 percent slopes

Setting

Landform: Flats and depressions on the Wisconsinan till plains

Map Unit Composition

Kokomo soil and similar components: 90 percent
Contrasting components:
Celina soils—5 percent
Crosby soils—5 percent

Soil Properties and Qualities

Available water capacity: About 11.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 14 to 29 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent

Parent material: Loamy material and the underlying till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

KoA—Kokomo silty clay loam, 0 to 1 percent slopes

Setting

Landform: Flats and depressions on the Wisconsinan till plains

Map Unit Composition

Kokomo soil and similar components: 90 percent
Contrasting components:
Celina soils—5 percent
Crosby soils—5 percent

Soil Properties and Qualities

Available water capacity: About 11.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 16 to 33 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy material and the underlying till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.

- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

LeB—Lewisburg-Celina silt loams, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Lewisburg soil and similar components: 50 percent
Celina soil and similar components: 40 percent
Contrasting components:
Crosby soils—5 percent
Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: Lewisburg—about 3.3 inches to a depth of 19 inches; Celina—about 6.5 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: Lewisburg—8.0 to 19 meq per 100 grams; Celina—9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Lewisburg—dense material at a depth of 10 to 20 inches; Celina—dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Lewisburg—0.5 foot to 2.0 feet; Celina—1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Lewisburg—basal till; Celina—a thin layer of loess and the underlying till
Permeability: Lewisburg—slow; Celina—very slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Lewisburg—high; Celina—medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by dense soil material.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the Lewisburg soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Subsurface drainage helps to lower the seasonal high water table in areas of the Lewisburg soil.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.
- In areas of the Lewisburg soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- In areas of the Lewisburg soil, using a system of conservation tillage when pastures are renovated conserves soil moisture.
- The Lewisburg soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Soil wetness may limit the use of log trucks in areas of the Lewisburg soil.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- In some areas of the Lewisburg soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- The moderate shrinking and swelling of the Celina soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- In areas of the Lewisburg soil, special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of shrinking and swelling, the Celina soil may not be suitable for use as base material for local roads and streets.
- The Celina soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soils: No

LfB2—Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Lewisburg soil and similar components: 70 percent
Celina soil and similar components: 20 percent
Contrasting components:
Crosby soils—5 percent
Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: Lewisburg—about 3.1 inches to a depth of 19 inches; Celina—about 5.7 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: Lewisburg—7.0 to 18 meq per 100 grams; Celina—8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Lewisburg—dense material at a depth of 10 to 20 inches; Celina—dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Lewisburg—0.5 foot to 2.0 feet; Celina—1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Lewisburg—basal till; Celina—till
Permeability: Lewisburg—slow; Celina—very slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Lewisburg—high; Celina—medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- In areas of the Lewisburg soil, subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.
- Because of the content of clay, the Lewisburg soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of log trucks in areas of the Lewisburg soil.
- In areas of the Celina soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- In some areas of the Lewisburg soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- The moderate shrinking and swelling of the Celina soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of

the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- In areas of the Lewisburg soil, special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of shrinking and swelling, the Celina soil may not be suitable for use as base material for local roads and streets.
- The Celina soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soils: No

LgC3—Lewisburg clay loam, 6 to 12 percent slopes, severely eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Lewisburg soil and similar components: 90 percent
Contrasting components:
Celina soils—5 percent
Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: About 2.9 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: 7.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 10 to 20 inches
Depth to the top of the seasonal high water table: 0.5 foot to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Basal till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Clay loam

Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Soil wetness may limit the use of log trucks.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site

development, and special design of structures may be needed to prevent the damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

LpA—Lippincott silty clay loam, 0 to 2 percent slopes

Setting

Landform: Depressions on the Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Lippincott soil and similar components: 80 percent
Contrasting components:
Savona soils—10 percent
Westland soils—10 percent

Soil Properties and Qualities

Available water capacity: About 5.1 inches to a depth of 36 inches
Cation-exchange capacity of the surface layer: 20 to 40 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 foot
Water table kind: Apparent
Ponding: Long

Depth of ponding: 0.0 to 1.0 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Silty material and the underlying outwash having a high content of limestone gravel and sand
Permeability: Moderate in the silty material and rapid in the outwash
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate

and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

MaA—Medway silt loam, 0 to 1 percent slopes, occasionally flooded

Setting

Landform: Flood plains

Map Unit Composition

Medway soil and similar components: 95 percent
Contrasting components:
Sloan soils—5 percent

Soil Properties and Qualities

Available water capacity: About 9.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 28 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Apparent
Ponding: None

Drainage class: Moderately well drained
Flooding: Occasional
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy alluvium
Permeability: Moderate
Potential for frost action: High
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent the damage caused by flooding.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting

heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Interpretive Groups

Land capability classification: 2w
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-5
Hydric soil: No

MbB2—Miami silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Miami soil and similar components: 85 percent
Contrasting components:
  Celina soils—10 percent
  Crosby soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases

the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

McE2—Miami-Kendallville silt loams, 18 to 25 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Backslopes

Map Unit Composition

Miami soil and similar components: 55 percent
Kendallville soil and similar components: 40 percent
Contrasting components:
Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: Miami—about 4.6 inches to a depth of 31 inches; Kendallville—about 4.7 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: Miami—6.0 to 17 meq per 100 grams; Kendallville—4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Miami—dense material at a depth of 24 to 40 inches; Kendallville—dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Miami—2.0 to 3.0 feet; Kendallville—more than 6.0 feet
Water table kind: Miami—perched; Kendallville—not applicable
Ponding: None
Drainage class: Miami—moderately well drained; Kendallville—well drained
Flooding: None
Organic matter content in the surface layer: Miami—1.0 to 2.0 percent; Kendallville—1.0 to 3.0 percent
Parent material: Miami—a thin layer of loess and the underlying till; Kendallville—a thin layer of loess and the underlying outwash and till
Permeability: Miami—very slow or slow; Kendallville—moderately slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter in areas of the Miami soil.
- In areas of the Kendallville soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Rock fragments in the Kendallville soil obstruct the use of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miami soil, because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Miami soil, the seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Miami—B-1; Kendallville—A-2
Hydric soils: No

McF2—Miami-Kendallville silt loams, 25 to 50 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Backslopes

Map Unit Composition

Miami soil and similar components: 50 percent
Kendallville soil and similar components: 40 percent
Contrasting components:
Miamian soils—10 percent

Soil Properties and Qualities

Available water capacity: Miami—about 4.3 inches to a depth of 28 inches; Kendallville—about 5.9 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: Miami—6.0 to 17 meq per 100 grams; Kendallville—4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Miami—dense material at a depth of 24 to 40 inches; Kendallville—dense material at a depth of 20 to 43 inches
Depth to the top of the seasonal high water table: Miami—2.0 to 3.0 feet; Kendallville—more than 6.0 feet
Water table kind: Miami—perched; Kendallville—not applicable
Ponding: None
Drainage class: Miami—moderately well drained; Kendallville—well drained
Flooding: None
Organic matter content in the surface layer: Miami—1.0 to 2.0 percent; Kendallville—1.0 to 3.0 percent
Parent material: Miami—a thin layer of loess and the underlying till; Kendallville—a thin layer of loess and the underlying outwash and till
Permeability: Miami—very slow or slow; Kendallville—moderately slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- These soils are generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- Because of the slope, the use of equipment to prepare sites for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- Burning may destroy organic matter in areas of the Miami soil.
- In areas of the Kendallville soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miami soil, because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Miami soil, the seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 7e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Miami—B-2; Kendallville—A-3
Hydric soils: No

MdC2—Miami loam, 6 to 12 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Shoulders

Map Unit Composition

Miami soil and similar components: 95 percent
Contrasting components:
Celina soils—5 percent

Soil Properties and Qualities

Available water capacity: About 3.9 inches to a depth of 26 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Till
Permeability: Very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

MdD2—Miami loam, 12 to 18 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Backslopes

Map Unit Composition

Miami soil and similar components: 95 percent
Contrasting components:
Celina soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 6.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 24 to 40 inches
Depth to the top of the seasonal high water table: 2.0 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 2.0 percent
Parent material: Till
Permeability: Very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland

Pasture and hayland suitability group: B-1
Hydric soil: No

MeC—Miamian silt loam, 6 to 12 percent slopes

Setting

Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Miamian soil and similar components: 85 percent
Contrasting components:
  Celina soils—10 percent
  Losantville soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.3 inches to a depth of 24 inches
Cation-exchange capacity of the surface layer: 10 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and a high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

MeC2—Miamian silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Miamian soil and similar components: 85 percent
Contrasting components:
  Celina soils—10 percent
  Losantville soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.1 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage (fig. 11).
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and a high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.

Figure 11.—Erosion in an area of Miamian silt loam, 6 to 12 percent slopes, eroded.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

MeD2—Miamian silt loam, 12 to 18 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Miamian soil and similar components: 85 percent
Contrasting components:
  Losantville soils—10 percent
  Celina soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 27 inches
Cation-exchange capacity of the surface layer: 9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Slow

Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material and a high clay content.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

MfB—Miamian-Celina silt loams, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Miamian soil and similar components: 60 percent
Celina soil and similar components: 30 percent
Contrasting components:
  Crosby soils—5 percent
  Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 6.5 inches to a depth of 35 inches; Celina—about 6.5 inches to a depth of 34 inches
Cation-exchange capacity of the surface layer: Miamian—10 to 18 meq per 100 grams; Celina—9.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth 20 to 40 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Celina—1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Miamian—well drained; Celina—moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till

Permeability: Miamian—slow; Celina—very slow
Potential for frost action: Miamian—moderate; Celina—high
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- In areas of the Celina soil, the root system of winter grain crops may be damaged by frost action.

Pastureland

- Erosion control is needed when pastures are renovated.
- In areas of the Celina soil, the root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- In areas of the Celina soil, because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.
- In some areas of the Miamian soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of

the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- In areas of the Celina soil, the seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: Miamian—A-1; Celina—A-6
Hydric soils: No

MfB2—Miamian-Celina silt loams, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Miamian soil and similar components: 60 percent
Celina soil and similar components: 30 percent
Contrasting components:
Crosby soils—5 percent
Kokomo soils—5 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 6.5 inches to a depth of 36 inches; Celina—about 6.3 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: Miamian—9.0 to 17 meq per 100 grams; Celina—8.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Celina—1.5 to 3.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Miamian—well drained; Celina—moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till
Permeability: Miamian—slow; Celina—very slow
Potential for frost action: Miamian—moderate; Celina—high
Shrink-swell potential: Moderate

Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- In areas of the Celina soil, the root system of winter grain crops may be damaged by frost action.

Pastureland

- Erosion control is needed when pastures are renovated.
- In areas of the Celina soil, the root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.
- In areas of the Celina soil, because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.
- In some areas of the Miamian soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of

the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- In areas of the Celina soil, the seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: Miamian—A-1; Celina—A-6
Hydric soils: No

MgE2—Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded

Setting

Landform: Wisconsinan till plains and moraines
Position on the landform: Backslopes

Map Unit Composition

Miamian soil and similar components: 70 percent
Kendallville soil and similar components: 20 percent
Contrasting components:
Hennepin soils—10 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 6.7 inches to a depth of 38 inches; Kendallville—about 4.4 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: Miamian—9.0 to 17 meq per 100 grams; Kendallville—4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Kendallville—more than 6.0 feet
Water table kind: Miamian—perched; Kendallville—not applicable
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Miamian—a thin layer of loess and the underlying till; Kendallville—a thin layer of loess and the underlying outwash and till
Permeability: Miamian—slow; Kendallville—moderately slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate

Surface layer texture: Silt loam
Potential for surface runoff: Miamian—very high; Kendallville—high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- In areas of the Kendallville soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- In areas of the Kendallville soil, using a system of conservation tillage when pastures are renovated conserves soil moisture.
- The Kendallville soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment and their operating efficiency is reduced.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.
- The slope may restrict the use of some mechanical planting equipment.
- Because of the content of clay, the Miamian soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The stickiness of the Miamian soil reduces the efficiency of mechanical planting equipment.
- In areas of the Kendallville soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Rock fragments in the Kendallville soil obstruct the use of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miamian soil, because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Miamian soil, the seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-2
Hydric soils: No

MgF2—Miamian-Kendallville silt loams, 25 to 50 percent slopes, eroded

Setting

Landform: Wisconsinan till plains and moraines
Position on the landform: Backslopes

Map Unit Composition

Miamian soil and similar components: 70 percent
Kendallville soil and similar components: 20 percent
Contrasting components:
Hennepin soils—10 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 5.1 inches to a depth of 28 inches; Kendallville—about 5.2 inches to a depth of 35 inches
Cation-exchange capacity of the surface layer: Miamian—9.0 to 17 meq per 100 grams; Kendallville—4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Kendallville—more than 6.0 feet
Water table kind: Miamian—perched; Kendallville—not applicable
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent

Parent material: Miamian—a thin layer of loess and the underlying till; Kendallville—a thin layer of loess and the underlying outwash and till
Permeability: Miamian—slow; Kendallville—moderately slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Miamian—very high; Kendallville—high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- These soils are generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Burning may destroy organic matter.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- Because of the slope, the use of equipment to prepare sites for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- In areas of the Miamian soil, because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- In areas of the Miamian soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the Miamian soil reduces the efficiency of mechanical planting equipment.
- Rock fragments in the Kendallville soil obstruct the use of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miamian soil, because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Miamian soil, the seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 7e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-3
Hydric soils: No

MhC3—Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Miamian soil and similar components: 60 percent
Losantville soil and similar components: 30 percent
Contrasting components:
  Celina soils—5 percent
  Miami soils—5 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 4.6 inches to a depth of 26 inches; Losantville—about 2.4 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: Miamian—8.0 to 16 meq per 100 grams; Losantville—9.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Miamian—dense material at a depth of 20 to 40 inches; Losantville—dense material at a depth of 12 to 20 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Losantville—1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Miamian—well drained; Losantville—moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Miamian—till; Losantville—basal till

Permeability: Miamian—slow; Losantville—very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Miamian—high; Losantville—very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- In areas of the Losantville soil, the movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table in areas of the Losantville soil.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.
- In areas of the Losantville soil, soil wetness may limit the use of log trucks.
- In areas of the Losantville soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and

building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines and seepage of poorly treated effluent is a concern.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the Losantville soil.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Miamian—A-1; Losantville—B-1
Hydric soils: No

MhD3—Miamian-Losantville clay loams, 12 to 18 percent slopes, severely eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Miamian soil and similar components: 60 percent
Losantville soil and similar components: 30 percent
Contrasting components:
Celina soils—5 percent
Miami soils—5 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 5.9 inches to a depth of 33 inches; Losantville—about 1.9 inches to a depth of 14 inches
Cation-exchange capacity of the surface layer: Miamian—8.0 to 16 meq per 100 grams; Losantville—9.0 to 21 meq per 100 grams
Depth class: Very deep

Depth to root-restrictive feature: Miamian—dense material at a depth of 20 to 40 inches; Losantville—dense material at a depth of 12 to 20 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Losantville—1.0 to 2.0 feet
Water table kind: Perched
Ponding: None
Drainage class: Miamian—well drained; Losantville—moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Miamian—till; Losantville—basal till
Permeability: Miamian—slow; Losantville—very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Miamian—high; Losantville—very high
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The rooting depth of crops is restricted by dense soil material.
- In areas of the Losantville soil, the movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table in areas of the Losantville soil.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.

- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.
- Because of the content of clay, the Miamian soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- In areas of the Miamian soil, the slope may restrict the use of some mechanical planting equipment.
- Soil wetness may limit the use of log trucks in areas of the Losantville soil.
- In areas of the Losantville soil, the slope may restrict the use of some mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- The moderate shrinking and swelling of the Miamian soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Miamian soil may not be suitable for use as base material for local roads and streets.
- The Miamian soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- In areas of the Losantville soil, special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland

Pasture and hayland suitability group: Miamian—A-1; Losantville—B-1
Hydric soils: No

MmE2—Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Miamian soil and similar components: 70 percent
Hennepin soil and similar components: 30 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 4.6 inches to a depth of 26 inches; Hennepin—about 2.8 inches to a depth of 19 inches
Cation-exchange capacity of the surface layer: Miamian—9.0 to 17 meq per 100 grams; Hennepin—14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Miamian—dense material at a depth of 20 to 40 inches; Hennepin—dense material at a depth of 10 to 20 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Hennepin—more than 6 feet
Water table kind: Miamian—perched; Hennepin—not applicable
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: Miamian—0.8 to 2.2 percent; Hennepin—0.5 to 2.0 percent
Parent material: Miamian—a thin layer of loess and the underlying till; Hennepin—basal till
Permeability: Slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.

- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- In areas of the Miamian soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Because of the content of clay, the Miamian soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- In areas of the Hennepin soil, the high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miamian soil, Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Miamian soil, the seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Because of the slope, designing local roads and streets is difficult.
- In areas of the Miamian soil, special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-2
Hydric soils: No

MnE3—Miamian-Hennepin clay loams, 18 to 25 percent slopes, severely eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Miamian soil and similar components: 70 percent
Hennepin soil and similar components: 30 percent

Soil Properties and Qualities

Available water capacity: Miamian—about 4.6 inches to a depth of 26 inches; Hennepin—about 2.7 inches to a depth of 18 inches
Cation-exchange capacity of the surface layer: Miamian—9.0 to 17 meq per 100 grams; Hennepin—14 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Miamian—dense material at a depth of 20 to 40 inches; Hennepin—dense material at a depth of 10 to 20 inches
Depth to the top of the seasonal high water table: Miamian—2.5 to 3.5 feet; Hennepin—more than 6 feet
Water table kind: Miamian—perched; Hennepin—not applicable
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 2.0 percent
Parent material: Miamian—till; Hennepin—basal till
Permeability: Slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Clay loam
Potential for surface runoff: Very high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- These soils provide poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.

- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.
- Because of the content of clay, the Miamian soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- In areas of the Miamian soil, because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- In areas of the Hennepin soil, the high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.
- In areas of the Miamian soil, because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Miamian soil, the seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- In areas of the Miamian soil, special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 7e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: A-2
Hydric soils: No

MpA—Milford silty clay loam, 0 to 2 percent slopes

Setting

Landform: Depressions on glacial lake plains

Map Unit Composition

Milford soil and similar components: 100 percent

Soil Properties and Qualities

Available water capacity: About 11.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 26 to 36 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Lacustrine sediments
Permeability: Moderately slow
Potential for frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

MrA—Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes

Setting

Landform: Depressions on glacial lake plains

Map Unit Composition

Milford soil and similar components: 100 percent

Soil Properties and Qualities

Available water capacity: About 11.5 inches to a depth of 60 inches

Cation-exchange capacity of the surface layer: 26 to 36 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 6.0 percent
Parent material: Lacustrine sediments over gravelly and sandy outwash
Permeability: Moderately slow in the lacustrine sediments and rapid or very rapid in the outwash
Potential for frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Clods may form if the soil is tilled when wet.
- Controlling traffic can minimize soil compaction.
- The rooting depth of crops may be restricted by the high clay content.
- A combination of surface and subsurface drainage helps to remove excess water (fig. 12).
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Figure 12.—Ponding in an area of Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes, can damage crops.

- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w

Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

MsA—Millsdale silt loam, 0 to 2 percent slopes

Setting

Landform: Depressions and flats on the Wisconsinan terraces

Map Unit Composition

Millsdale soil and similar components: 90 percent
Contrasting components:
Randolph soils—10 percent

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 25 inches
Cation-exchange capacity of the surface layer: 20 to 36 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 7.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: High
Shrink-swell potential: High
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock and the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 4w

Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-2
Hydric soil: Yes

MtA—Millsdale silty clay loam, 0 to 2 percent slopes

Setting

Landform: Depressions and flats on the Wisconsinan till plains

Map Unit Composition

Millsdale soil and similar components: 90 percent
Contrasting components:
Randolph soils—10 percent

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 20 to 36 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 1.0 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 4.0 to 7.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: High
Shrink-swell potential: High
Surface layer texture: Silty clay loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- A combination of surface and subsurface drainage helps to remove excess water.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.

- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.
- Because of the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 4w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-2
Hydric soil: Yes

MuA—Milton silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Milton soil and similar components: 95 percent
Contrasting components:
  Randolph soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.2 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2s
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

MuB—Milton silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Milton soil and similar components: 95 percent
Contrasting components:
Randolph soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.7 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 10 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.

- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

MuB2—Milton silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Milton soil and similar components: 95 percent
Contrasting components:
  Randolph soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches

Depth to the top of the seasonal high water table: More than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

MuC2—Milton silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Milton soil and similar components: 95 percent
Contrasting components:
Randolph soils—5 percent

Soil Properties and Qualities

Available water capacity: About 4.4 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone

Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

MuD2—Milton silt loam, 12 to 18 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Milton soil and similar components: 90 percent
Contrasting components:
Randolph soils—10 percent

Soil Properties and Qualities

Available water capacity: About 4.6 inches to a depth of 29 inches
Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.4 feet
Ponding: None
Drainage class: Well drained

Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

MuE2—Milton silt loam, 18 to 25 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Milton soil and similar components: 95 percent
Contrasting components:
Randolph soils—5 percent

Soil Properties and Qualities

Available water capacity: About 3.6 inches to a depth of 23 inches

Cation-exchange capacity of the surface layer: 8.0 to 20 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 1.9 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone
Permeability: Moderate or moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Properly designed erosion-control practices are needed on the steeper slopes.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.

- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the content of clay, this soil becomes sticky when wet. The stickiness increases the cost of constructing haul roads and log landings.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.
- Burning may destroy organic matter.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 6e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

MwA—Morningsun silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition

Morningsun soil and similar components: 85 percent
Contrasting components:
Sugarvalley soils—10 percent
Cyclone soils—5 percent

Soil Properties and Qualities

Available water capacity: About 12.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 11 to 23 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water-modified till
Permeability: Moderate
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

MxA—Morningsun-Xenia silt loams, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition

Morningsun soil and similar components: 70 percent
Xenia soil and similar components: 20 percent
Contrasting components:
Cyclone soils—6 percent
Fincastle soils—2 percent
Sugarvalley soils—2 percent

Soil Properties and Qualities

Available water capacity: Morningsun—about 13.1 inches to a depth of 60 inches; Xenia—about 8.6 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: Morningsun—11 to 23 meq per 100 grams; Xenia—6.0 to 20 meq per 100 grams
Depth class: Very deep

Depth to root-restrictive feature: Morningsun—more than 80 inches; Xenia—dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: Morningsun—2.0 to 3.5 feet; Xenia—1.5 to 2.5 feet
Water table kind: Morningsun—apparent; Xenia—perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Morningsun—loess and the underlying water-modified till; Xenia—loess and the underlying till
Permeability: Morningsun—moderate; Xenia—slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Morningsun soil, careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- In areas of the Xenia soil, the stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- In areas of the Morningsun soil, because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas of the Morningsun soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

- The moderate shrinking and swelling of the Xenia soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of shrinking and swelling, the Xenia soil may not be suitable for use as base material for local roads and streets.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the Xenia soil.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soils: No

MxB—Morningsun-Xenia silt loams, 2 to 6 percent slopes

Setting

Landform: Sight rises on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition

Morningsun soil and similar components: 60 percent
Xenia soil and similar components: 20 percent
Contrasting components:
Celina soils—10 percent
Miamian soils—5 percent
Fincastle soils—3 percent
Sugarvalley soils—2 percent

Soil Properties and Qualities

Available water capacity: Morningsun—about 12.0 inches to a depth of 60 inches; Xenia—about 9.5 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: Morningsun—11 to 23 meq per 100 grams; Xenia—6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Morningsun—more than 80 inches; Xenia—dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: Morningsun—2.0 to 3.5 feet; Xenia—1.5 to 2.5 feet

Water table kind: Morningsun—apparent; Xenia—perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Morningsun—loess and the underlying water-modified till; Xenia—loess and the underlying till
Permeability: Morningsun—moderate; Xenia—slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Morningsun soil, careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the Xenia soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- In areas of the Morningsun soil, because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas of the Morningsun soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

- The moderate shrinking and swelling of the Xenia soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of shrinking and swelling, the Xenia soil may not be suitable for use as base material for local roads and streets.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the Xenia soil.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soils: No

MxB2—Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan ground moraines
Position on the landform: Shoulders

Map Unit Composition

Morningsun soil and similar components: 50 percent
Xenia soil and similar components: 30 percent
Contrasting components:
Miamian soils—10 percent
Celina soils—5 percent
Fincastle soils—3 percent
Sugarvalley soils—2 percent

Soil Properties and Qualities

Available water capacity: Morningsun—about 12.0 inches to a depth of 60 inches; Xenia—about 8.4 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: Morningsun—10 to 22 meq per 100 grams; Xenia—5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Morningsun—more than 80 inches; Xenia—dense material at a depth of 40 to 60 inches

Depth to the top of the seasonal high water table: Morningsun—2.0 to 3.5 feet; Xenia—1.5 to 2.5 feet
Water table kind: Morningsun—apparent; Xenia—perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Morningsun—loess and the underlying water-modified till; Xenia—loess and the underlying till
Permeability: Morningsun—moderate; Xenia—slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Morningsun soil, careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Burning may destroy organic matter.
- The stickiness of the Xenia soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and

basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In areas of the Morningsun soil, because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas of the Morningsun soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of shrinking and swelling, the Xenia soil may not be suitable for use as base material for local roads and streets.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the Xenia soil.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soils: No

MyA—Mahalasville silt loam, 0 to 2 percent slopes

Setting

Landform: Depressions on lake plains

Map Unit Composition

Mahalasville soil and similar components: 100 percent

Soil Properties and Qualities

Available water capacity: About 9.4 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 17 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 foot
Drainage class: Very poorly drained
Flooding: None

Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loess or other silty material and the underlying loamy and sandy outwash
Permeability: Moderate in the solum and moderately rapid in the substratum
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- Because of ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

OcA—Ockley silt loam, 0 to 2 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Ockley soil and similar components: 90 percent
Contrasting components:
  Eldean soils—5 percent
  Warsaw soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.5 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 40 to 72 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: A thin layer of loess and loamy outwash over stratified sand and gravel
Permeability: Moderate in the solum and very rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Incorporating crop residue or other organic matter into the surface layer increases

the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

OcB—Ockley silt loam, 2 to 6 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Ockley soil and similar components: 85 percent
Contrasting components:
Eldean soils—10 percent
Warsaw soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.7 inches to a depth of 50 inches
Cation-exchange capacity of the surface layer: 3.0 to 15 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 40 to 72 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: A thin layer of loess and loamy outwash over stratified sand and gravel
Permeability: Moderate in the solum and very rapid in the substratum
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.

- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

Pg—Pits, gravel

Setting

Landform: Outwash terraces and outwash plains
Shape of areas: Irregular
Size of areas: 5 to 50 acres

Map Unit Composition

Pits, gravel, and similar components: 100 percent

Definition

This map unit consists of open excavations from which gravel and sand have been removed.

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of this map unit for specific uses.

Interpretive Groups

Land capability classification: None assigned
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Not rated
Hydric soils: Unranked

Pq—Pits, quarry

Setting

Landform: None assigned
Shape of areas: Irregular
Size of areas: 5 to 200 acres

Map Unit Composition

Pits, quarry, and similar components: 100 percent

Definition

This map unit consists of areas where dolomite has been quarried.

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of this map unit for specific uses.

Interpretive Groups

Land capability classification: None assigned
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Not rated
Hydric soils: Unranked

PtB—Plattville silt loam, moderately wet, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Plattville soil and similar components: 85 percent
Contrasting components:
Millsdale soils—5 percent
Milton soils—5 percent
Randolph soils—5 percent

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 54 inches
Cation-exchange capacity of the surface layer: 10 to 24 meq per 100 grams

Depth class: Deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: A thin layer of loess and the underlying outwash and residuum weathered from limestone
Permeability: Moderate in the solum and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of properly installing the effluent distribution lines.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.
- The moderate permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

RaA—Rainsville silt loam, 0 to 2 percent slopes

Setting

Landform: Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition

Rainsville soil and similar components: 85 percent
Contrasting components:
    Ockley soils—10 percent
    Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: About 10.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 7.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying loamy outwash and till
Permeability: Very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam

Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- This soil is well suited to pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

RaB—Rainsville silt loam, 2 to 6 percent slopes

Setting

Landform: Wisconsinan ground moraines
Position on the landform: Backslopes

Map Unit Composition

Rainsville soil and similar components: 85 percent
Contrasting components:
  Ockley soils—10 percent
  Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: About 9.6 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying loamy outwash and till
Permeability: Very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

RaB2—Rainsville silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Wisconsinan ground moraines
Position on the landform: Backslopes

Map Unit Composition

Rainsville soil and similar components: 85 percent
Contrasting components:
    Ockley soils—10 percent
    Miamian soils—5 percent

Soil Properties and Qualities

Available water capacity: About 9.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 7.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 2.0 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained

Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying loamy outwash and till
Permeability: Very slow or slow
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

RcA—Randolph silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Randolph soil and similar components: 95 percent
Contrasting components:
  Millsdale soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.0 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 foot
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.

- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 3w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-2
Hydric soil: No

RcB—Randolph silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Randolph soil and similar components: 90 percent
Contrasting components:
    Milton soils—10 percent

Soil Properties and Qualities

Available water capacity: About 4.5 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: 8.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (lithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: 0.5 to 1.0 foot
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Till over limestone
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam

Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- The movement of water into subsurface drains is restricted. Drainage guides can be used to determine tile spacing requirements.
- Subsurface drainage helps to lower the seasonal high water table.
- Including deep-rooted cover crops in the rotation is important for improving soil structure and providing pathways in the clayey subsoil that can facilitate the movement of water into subsurface drains.
- The depth to bedrock may restrict the gradient needed to provide adequate drainage from subsurface systems.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- The rooting depth of plants may be restricted by bedrock.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

- Because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The depth to bedrock and hardness of the bedrock greatly reduce the ease of excavation and increase the difficulty of constructing foundations and installing utilities.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas, the high content of clay in the subsurface layer increases the difficulty of digging, filling, and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- The depth to bedrock and hardness of the bedrock reduce the ease of excavation and increase the difficulty of constructing roads.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-2
Hydric soil: No

RnE2—Rodman gravelly loam, 18 to 25 percent slopes, eroded

Setting

Landform: Outwash plains
Position on the landform: Backslopes

Map Unit Composition

Rodman soil and similar components: 85 percent
Contrasting components:
Fox soils—15 percent

Soil Properties and Qualities

Available water capacity: About 2.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Excessively drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential for frost action: Low
Shrink-swell potential: Low
Surface layer texture: Gravelly loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- The slope may restrict the use of some mechanical planting equipment.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 7s
Prime farmland: Not prime farmland
Pasture and hayland suitability group: B-1
Hydric soil: No

RnF2—Rodman gravelly loam, 25 to 50 percent slopes, eroded

Setting

Landform: Outwash plains
Position on the landform: Backslopes

Map Unit Composition

Rodman soil and similar components: 85 percent
Contrasting components:
Fox soils—15 percent

Soil Properties and Qualities

Available water capacity: About 2.7 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 5.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Excessively drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 4.0 percent
Parent material: Outwash
Permeability: Moderately rapid in the solum and very rapid in the substratum
Potential for frost action: Low
Shrink-swell potential: Low
Surface layer texture: Gravelly loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- This soil is generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Sandy layers in this soil increase the maintenance of haul roads and log landings.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- The slope creates unsafe operating conditions and reduces the operating efficiency of harvesting and mechanical planting equipment.
- Because of the slope, the use of equipment to prepare sites for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 7s
Prime farmland: Not prime farmland
Pasture and hayland suitability group: B-2
Hydric soil: No

RoE2—Rodman-Kendallville complex, 18 to 25 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Rodman—backslopes; Kendallville—footslopes

Map Unit Composition

Rodman soil and similar components: 50 percent
Kendallville soil and similar components: 40 percent

Contrasting components:
Fox soils—10 percent

Soil Properties and Qualities

Available water capacity: Rodman—about 2.7 inches to a depth of 60 inches; Kendallville—about 7.7 inches to a depth of 49 inches
Cation-exchange capacity of the surface layer: Rodman—5.0 to 18 meq per 100 grams; Kendallville—4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Rodman—more than 80 inches; Kendallville—dense material at a depth of 28 to 53 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Rodman—excessively drained; Kendallville—well drained
Flooding: None
Organic matter content in the surface layer: Rodman—2.0 to 4.0 percent; Kendallville—0.8 to 2.2 percent
Parent material: Rodman—outwash; Kendallville—a thin layer of loess and the underlying outwash and till
Permeability: Rodman—moderately rapid in the solum and very rapid in the substratum; Kendallville—moderately slow
Potential for frost action: Rodman—low; Kendallville—moderate
Shrink-swell potential: Rodman—low; Kendallville—moderate
Surface layer texture: Rodman—gravelly loam; Kendallville—loam
Potential for surface runoff: Rodman—medium; Kendallville—high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- In areas of the Rodman soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- In areas of the Rodman soil, using a system of conservation tillage when pastures are renovated conserves soil moisture.
- The Rodman soil provides poor summer pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- The slope restricts the use of equipment for preparing sites for planting and seeding.

- The slope may restrict the use of some mechanical planting equipment.
- Sandy layers in the Rodman soil increase the maintenance of haul roads and log landings.
- Rock fragments in the Rodman soil obstruct the use of mechanical planting equipment.
- In areas of the Kendallville soil, a loss of soil productivity may occur following an episode of fire.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In areas of the Rodman soil, because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- The moderate shrinking and swelling of the Kendallville soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas of the Kendallville soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Rodman soil, the excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability of the Kendallville soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Kendallville soil may not be suitable for use as base material for local roads and streets.
- In areas of the Kendallville soil, local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The Kendallville soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 7s
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Rodman—B-1; Kendallville—A-2
Hydric soils: No

RoF2—Rodman-Kendallville complex, 25 to 50 percent slopes, eroded

Setting

Landform: Kames
Position on the landform: Rodman—backslopes; Kendallville—footslopes

Map Unit Composition

Rodman soil and similar components: 50 percent
Kendallville soil and similar components: 40 percent
Contrasting components:
Fox soils—10 percent

Soil Properties and Qualities

Available water capacity: Rodman—about 2.7 inches to a depth of 60 inches; Kendallville—about 6.1 inches to a depth of 40 inches
Cation-exchange capacity of the surface layer: Rodman—5.0 to 18 meq per 100 grams; Kendallville—4.0 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Rodman—more than 80 inches; Kendallville—dense material at a depth of 28 to 53 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Rodman—excessively drained; Kendallville—well drained
Flooding: None
Organic matter content in the surface layer: Rodman—2.0 to 4.0 percent; Kendallville—0.8 to 2.2 percent
Parent material: Rodman—outwash; Kendallville—a thin layer of loess and the underlying outwash and till
Permeability: Rodman—moderately rapid in the solum and very rapid in the substratum; Kendallville—moderately slow
Potential for frost action: Rodman—low; Kendallville—moderate
Shrink-swell potential: Rodman—low; Kendallville—moderate
Surface layer texture: Rodman—gravelly loam; Kendallville—loam
Potential for surface runoff: Rodman—medium; Kendallville—high
Wind erosion hazard: Slight

Use and Management Considerations

Pastureland

- These soils are generally not recommended for pasture.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the slope, the operating conditions of harvesting and mechanical planting equipment are unsafe and their operating efficiency is reduced.
- Because of the slope, the use of equipment to prepare sites for planting and seeding is not practical.
- Because of the slope, the use of mechanical planting equipment is not practical.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- Sandy layers in the Rodman soil increase the maintenance of haul roads and log landings.
- In areas of the Kendallville soil, because of the low soil strength, harvesting

equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Burning in areas of the Kendallville soil may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- In areas of the Rodman soil, because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- The moderate shrinking and swelling of the Kendallville soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas of the Kendallville soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the slope, special design and installation techniques are needed for the effluent distribution lines.
- In areas of the Rodman soil, the excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The restricted permeability of the Kendallville soil limits the absorption and proper treatment of the effluent from septic systems.

Local roads and streets

- Because of the slope, designing local roads and streets is difficult.
- Because of shrinking and swelling, the Kendallville soil may not be suitable for use as base material for local roads and streets.
- In areas of the Kendallville soil, local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The Kendallville soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 7s
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Rodman—B-2; Kendallville—A-3
Hydric soils: No

RpA—Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded

Setting

Landform: Flood plains

Map Unit Composition

Rossburg soil and similar components: 85 percent

Contrasting components:
    Stonelick soils—10 percent
    Sloan soils—5 percent

Soil Properties and Qualities

Available water capacity: About 9.2 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 32 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 3.5 to 6.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Well drained
Flooding: Occasional
Organic matter content in the surface layer: 4.0 to 8.0 percent
Parent material: Loamy alluvium over sandy and gravelly alluvium
Permeability: Moderate in the solum and moderately rapid or rapid in the substratum
Potential for frost action: Moderate in the loamy alluvium and moderately rapid or rapid in the sandy and gravelly alluvium
Shrink-swell potential: Low
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Controlling traffic can minimize soil compaction.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- Small grain crops may be damaged by flooding in winter and spring.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Under normal weather conditions, this soil is subject to occasional flooding. The flooding may result in physical damage and costly repairs to buildings. This soil is generally unsuited to homesites. Special design of some structures, such as farm outbuildings, may be needed to prevent the damage caused by flooding.

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Interpretive Groups

Land capability classification: 2w
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-5
Hydric soil: No

RuB—Russell-Miamian silt loams, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Russell soil and similar components: 70 percent
Miamian soil and similar components: 20 percent
Contrasting components:
  Celina soils—5 percent
  Xenia soils—5 percent

Soil Properties and Qualities

Available water capacity: Russell—about 10.9 inches to a depth of 58 inches; Miamian—about 5.3 inches to a depth of 32 inches
Cation-exchange capacity of the surface layer: Russell—5.0 to 19 meq per 100 grams; Miamian—10 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Russell—dense material at a depth of 40 to 65 inches; Miamian—dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Russell—3.5 to 6.0 feet; Miamian—2.5 to 3.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: Russell—0.5 to 2.0 percent; Miamian—1.0 to 3.0 percent
Parent material: Russell—loess and the underlying till; Miamian—a thin layer of loess and the underlying till

Permeability: Russell—moderately slow; Miamian—slow
Potential for frost action: Russell—high; Miamian—moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Russell—low; Miamian—medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Russell soil, the root system of winter grain crops may be damaged by frost action.
- In areas of the Miamian soil, incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- In areas of the Miamian soil, the rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.
- In areas of the Russell soil, the root systems of plants may be damaged by frost action.
- In areas of the Miamian soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- In areas of the Miamian soil, using a system of conservation tillage when pastures are renovated conserves soil moisture.
- The Miamian soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- In areas of the Russell soil, because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Burning in areas of the Russell soil may destroy organic matter.
- In areas of the Miamian soil, because of the stickiness of the soil, the use of equipment for site preparation is restricted to the drier periods.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and

building maintenance may be required. Special design of structures is needed to prevent damage caused by wetness.
- In some areas of the Miamian soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: Russell—A-6; Miamian—A-1
Hydric soils: No

RuB2—Russell-Miamian silt loams, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Russell soil and similar components: 50 percent
Miamian soil and similar components: 40 percent
Contrasting components:
Celina soils—5 percent
Xenia soils—5 percent

Soil Properties and Qualities

Available water capacity: Russell—about 9.4 inches to a depth of 50 inches; Miamian—about 5.9 inches to a depth of 33 inches
Cation-exchange capacity of the surface layer: Russell—4.0 to 18 meq per 100 grams; Miamian—9.0 to 17 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Russell—dense material at a depth of 40 to 63 inches; Miamian—dense material at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: Russell—3.5 to 6.0 feet; Miamian—2.5 to 3.5 feet

Water table kind: Perched
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: Russell—0.5 to 2.0 percent; Miamian—0.8 to 2.2 percent
Parent material: Russell—loess and the underlying till; Miamian—a thin layer of loess and the underlying till
Permeability: Russell—moderately slow; Miamian—slow
Potential for frost action: Russell—high; Miamian—moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Russell—low; Miamian—medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- In areas of the Russell soil, the root system of winter grain crops may be damaged by frost action.
- In areas of the Miamian soil, incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- In areas of the Miamian soil, the rooting depth of crops is restricted by dense soil material.

Pastureland

- Erosion control is needed when pastures are renovated.
- In areas of the Russell soil, the root systems of plants may be damaged by frost action.
- In areas of the Miamian soil, plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- In areas of the Miamian soil, using a system of conservation tillage when pastures are renovated conserves soil moisture.
- The Miamian soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.
- In areas of the Miamian soil, because of the low soil strength, harvesting equipment

may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.
- In some areas of the Miamian soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: Russell—A-6; Miamian—A-1
Hydric soils: No

SeA—Savona silt loam, 0 to 2 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Savona soil and similar components: 85 percent
Contrasting components:
Lippincott soils—10 percent
Eldean soils—5 percent

Soil Properties and Qualities

Available water capacity: About 6.8 inches to a depth of 45 inches
Cation-exchange capacity of the surface layer: 10 to 21 meq per 100 grams
Depth class: Very deep

Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 30 to 50 inches
Depth to the top of the seasonal high water table: 0.5 foot to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 0.5 to 3.0 percent
Parent material: Silty material and the underlying outwash having a high content of limestone gravel and sand
Permeability: Moderately slow or moderate in the silty material and rapid in the outwash
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- Rock fragments in the soil obstruct the use of mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and

basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: No

SnA—Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Sloan soil and similar components: 85 percent
Contrasting components:
Eel soils—10 percent
Medway soils—5 percent

Soil Properties and Qualities

Available water capacity: About 10.5 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 13 to 26 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: 0.0 to 1.0 foot
Water table kind: Apparent
Ponding: Long

Depth of ponding: 0.0 to 1.0 foot
Drainage class: Very poorly drained
Flooding: Frequent
Organic matter content in the surface layer: 3.0 to 6.0 percent
Parent material: Loamy alluvium over sandy alluvium
Permeability: Moderately slow or moderate in the loamy alluvium and moderately rapid or rapid in the sandy alluvium
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Winter grain crops are commonly not grown because of the frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.
- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Soil wetness may limit the use of log trucks.
- Flooding and ponding restrict the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. The soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.
- Because of the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- Special design of roads and bridges is needed to prevent the damage caused by flooding.

Interpretive Groups

Land capability classification: 3w
Prime farmland: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Pasture and hayland suitability group: C-3
Hydric soil: Yes

StA—Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded

Setting

Landform: Flood plains

Map Unit Composition

Stonelick soil and similar components: 90 percent
Contrasting components:
Rossburg soils—10 percent

Soil Properties and Qualities

Available water capacity: About 7.0 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 12 to 18 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: Frequent
Organic matter content in the surface layer: 0.5 to 2.0 percent

Parent material: Calcareous, loamy and sandy alluvium over gravelly alluvium
Permeability: Moderately rapid in the loamy and sandy alluvium and rapid in the gravelly alluvium
Potential for frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Winter grain crops are commonly not grown because of the frequent flooding.
- Measures that protect the soil from scouring and minimize the loss of crop residue by floodwaters are needed.

Pastureland

- Forage production can be improved by seeding grass-legume mixtures that are tolerant of flooding.
- Sediment left on forage plants after a flood event may reduce palatability and forage intake by the grazing animal.

Woodland

- The high pH in the soil may cause a nutrient imbalance in seedlings.
- The high content of lime in the upper part of the soil may cause a nutrient imbalance in seedlings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Flooding may result in damage to haul roads and increased maintenance costs.
- Flooding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- A loss of soil productivity may occur following an episode of fire.

Building sites

- The frequent flooding in areas of this soil greatly increases the risk of damage associated with floodwaters. Because of the flooding, this soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- This soil is generally unsuited to septic tank absorption fields. The flooding greatly limits the absorption and proper treatment of the effluent from septic systems. Rapidly moving floodwaters may damage some components of septic systems.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Figure 13.—Flooding in an area of Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded.

- Special design of roads and bridges is needed to prevent the damage caused by flooding (fig. 13).

Interpretive Groups

Land capability classification: 3w
Prime farmland: Prime farmland if protected from flooding or not frequently flooded during the growing season
Pasture and hayland suitability group: A-5
Hydric soil: No

SvA—Sugarvalley silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition

Sugarvalley soil and similar components: 90 percent
Contrasting components:
Fincastle soils—4 percent
Cyclone soils—2 percent
Morningsun soils—2 percent
Xenia soils—2 percent

Soil Properties and Qualities

Available water capacity: About 11.8 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 10 to 26 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: More than 80 inches

Depth to the top of the seasonal high water table: 0.5 foot to 2.0 feet
Water table kind: Apparent
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying water-modified till
Permeability: Moderate
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of

the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: No

SwA—Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits

Map Unit Composition

Sugarvalley soil and similar components: 60 percent
Fincastle soil and similar components: 30 percent
Contrasting components:
Cyclone soils—5 percent
Xenia soils—3 percent
Morningsun soils—2 percent

Soil Properties and Qualities

Available water capacity: Sugarvalley—about 11.4 inches to a depth of 60 inches; Fincastle—about 9.2 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: Sugarvalley—10 to 26 meq per 100 grams; Fincastle—6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Sugarvalley—more than 80 inches; Fincastle—dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: Sugarvalley—0.5 foot to 2.0 feet; Fincastle—0.5 foot to 1.5 feet
Water table kind: Sugarvalley—apparent; Fincastle—perched
Ponding: None
Drainage class: Somewhat poorly drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Sugarvalley—loess and the underlying water-modified till; Fincastle—loess and the underlying till

Permeability: Sugarvalley—moderate; Fincastle—slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Subsurface drainage helps to lower the seasonal high water table.
- In areas of the Sugarvalley soil, careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- In areas of the Fincastle soil, a seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- The stickiness of the Fincastle soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. These soils are poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- In some areas of the Sugarvalley soil, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- The restricted permeability of the soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of

the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, these soils may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- These soils have a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soils: No

ThA—Thackery silt loam, 0 to 2 percent slopes

Setting

Landform: Stream terraces
Position on the landform: Treads

Map Unit Composition

Thackery soil and similar components: 95 percent
Contrasting components:
Westland soils—5 percent

Soil Properties and Qualities

Available water capacity: About 9.7 inches to a depth of 54 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 35 to 70 inches
Depth to the top of the seasonal high water table: 1.0 to 2.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material and the underlying calcareous outwash
Permeability: Moderate in the loamy material and rapid in the outwash
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.
- Systematic subsurface drainage extends the period of planting and harvesting crops.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting

heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

ThB—Thackery silt loam, 2 to 6 percent slopes

Setting

Landform: Stream terraces
Position on the landform: Treads

Map Unit Composition

Thackery soil and similar components: 95 percent
Contrasting components:
Westland soils—5 percent

Soil Properties and Qualities

Available water capacity: About 10.3 inches to a depth of 60 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 35 to 70 inches
Depth to the top of the seasonal high water table: 2.5 to 3.5 feet
Water table kind: Apparent
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loamy material and the underlying calcareous outwash
Permeability: Moderate in the loamy material and rapid in the outwash
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. Special design of structures is needed to prevent the damage caused by wetness.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

Ud—Udorthents

Setting

Landform: Disturbed areas

Map Unit Composition

Udorthents and similar components: 100 percent

Definition

This map unit consists of borrow areas that have been surface mined for roadfill and areas used for landfills.

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of this map unit for specific uses.

Interpretive Groups

Land capability classification: None assigned
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Not rated
Hydric soils: Unranked

W—Water

Setting

Landform: Bodies of water

Map Unit Composition

Water areas and similar components: 100 percent

Definition

This map unit consists of areas that are used as ponds and bodies of water.

Use and Management Considerations

- Onsite investigation is needed to determine the suitability of this map unit for specific uses.

Interpretive Groups

Land capability classification: None assigned
Prime farmland: Not prime farmland
Pasture and hayland suitability group: Not rated
Hydric soils: Unranked

WbA—Warsaw loam, 0 to 2 percent slopes

Setting

Landform: Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Warsaw soil and similar components: 90 percent
Contrasting components:
Eldean soils—5 percent
Ockley soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.6 inches to a depth of 30 inches
Cation-exchange capacity of the surface layer: 10 to 25 meq per 100 grams
Depth class: Very deep

Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 6.0 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loamy material and the underlying gravelly outwash
Permeability: Moderate in the loamy material and very rapid in the gravelly outwash
Potential for frost action: Moderate
Shrink-swell potential: Low
Surface layer texture: Loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- The rooting depth of crops is restricted by soil layers that have strongly contrasting textures.

Pastureland

- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- This soil is well suited to building site development.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The excessive permeability limits the proper treatment of the effluent from septic systems. The poorly treated effluent may pollute the water table in the area of the absorption field.

Local roads and streets

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2s
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-1
Hydric soil: No

WnA—Westland silt loam, 0 to 2 percent slopes

Setting

Landform: Depressions on the Wisconsinan outwash terraces
Position on the landform: Treads

Map Unit Composition

Westland soil and similar components: 85 percent
Contrasting components:
Lippincott soils—5 percent
Savona soils—5 percent
Thackery soils—5 percent

Soil Properties and Qualities

Available water capacity: About 7.7 inches to a depth of 51 inches
Cation-exchange capacity of the surface layer: 15 to 31 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Strongly contrasting textural stratification at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: 0.0 to 0.5 foot
Water table kind: Apparent
Ponding: Long
Depth of ponding: 0.0 to 0.5 foot
Drainage class: Very poorly drained
Flooding: None
Organic matter content in the surface layer: 2.0 to 5.0 percent
Parent material: Loamy material over calcareous, stratified gravelly and sandy outwash
Permeability: Moderate in the loamy material and very rapid in the gravelly and sandy outwash
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Negligible
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- A combination of surface and subsurface drainage helps to remove excess water.

Pastureland

- Excess water should be removed from the pasture, or grass or legume species that are adapted to wet soil conditions should be planted.
- The root systems of plants may be damaged by frost action.
- Restricting grazing during wet periods can minimize compaction.

Woodland

- A seasonal high water table can inhibit the growth of some species of seedlings by reducing root respiration.
- Standing water can inhibit the growth of some species of seedlings by restricting root respiration.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Soil wetness may limit the use of log trucks.
- Ponding restricts the safe use of roads by log trucks.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.

Building sites

- Because water tends to pond on this soil, the period when excavations can be made may be restricted and intensive construction site development and building maintenance may be needed. This soil is generally unsuited to building site development.
- Because of the high content of sand or gravel in the soil, the resistance to sloughing is reduced in shallow excavations and cutbanks are susceptible to caving.
- In some areas, the dense nature of the subsurface layer increases the difficulty of digging and compacting the soil material in shallow excavations.

Septic tank absorption fields

- Because of the ponding, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Ponding affects the ease of excavation and grading and limits the bearing capacity of the soil.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.

Interpretive Groups

Land capability classification: 2w
Prime farmland: Prime farmland if drained
Pasture and hayland suitability group: C-1
Hydric soil: Yes

WyB—Wynn silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Wynn soil and similar components: 100 percent

Soil Properties and Qualities

Available water capacity: About 5.3 inches to a depth of 31 inches
Cation-exchange capacity of the surface layer: 9.0 to 22 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (paralithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.6 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.

- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty of constructing foundations and installing utilities.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

WyB2—Wynn silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Wynn soil and similar components: 100 percent

Soil Properties and Qualities

Available water capacity: About 5.2 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (paralithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock

Potential for frost action: Moderate
Shrink-swell potential: High
Surface layer texture: Silt loam
Potential for surface runoff: Medium
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock and a high clay content.
- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty of constructing foundations and installing utilities.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

WyC2—Wynn silt loam, 6 to 12 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Wynn soil and similar components: 100 percent

Soil Properties and Qualities

Available water capacity: About 4.4 inches to a depth of 23 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (paralithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 1.9 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.

- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty of constructing foundations and installing utilities.
- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs may be required to ensure satisfactory performance.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.

- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 3e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

WyD2—Wynn silt loam, 12 to 18 percent slopes, eroded

Setting

Landform: Wisconsinan till plains
Position on the landform: Backslopes

Map Unit Composition

Wynn soil and similar components: 95 percent
Contrasting components:
Hennepin soils—5 percent

Soil Properties and Qualities

Available water capacity: About 5.3 inches to a depth of 28 inches
Cation-exchange capacity of the surface layer: 8.0 to 21 meq per 100 grams
Depth class: Moderately deep
Depth to root-restrictive feature: Bedrock (paralithic) at a depth of 20 to 40 inches
Depth to the top of the seasonal high water table: More than 2.3 feet
Ponding: None
Drainage class: Well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: A thin layer of loess and the underlying till over limestone and shale
Permeability: Moderately slow in the till and slow to impermeable in the underlying bedrock
Potential for frost action: Moderate
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: High
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The rooting depth of crops is restricted by bedrock.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.

- Incorporating crop residue or other organic matter into the surface layer increases the capacity of the soil to hold and retain moisture. Plants may suffer from moisture stress because of the limited available water capacity.
- Careful selection and application of chemicals and fertilizers helps to minimize the possibility of ground-water contamination.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Avoiding overgrazing can reduce the hazard of erosion.
- Maintaining healthy plants and vegetative cover can reduce the hazard of erosion.
- Erosion control is needed when pastures are renovated.
- Plants may suffer from moisture stress during the drier summer months because of the limited available water capacity.
- Using a system of conservation tillage when pastures are renovated conserves soil moisture.
- This soil provides poor summer pasture.
- The rooting depth of plants may be restricted by bedrock.

Woodland

- If the soil is disturbed, the slope increases the hazard of erosion.
- The slope increases excavation costs, poses safety hazards, and creates a potential for erosion during the construction of haul roads and log landings.
- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Bedrock may interfere with the construction of haul roads and log landing sites.
- Because of the slope, operating conditions for log trucks are unsafe and their operating efficiency is reduced.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The slope may restrict the use of some mechanical planting equipment.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- The slope restricts the use of equipment for preparing sites for planting and seeding.
- Burning may destroy organic matter.

Building sites

- The slope influences the use of machinery and the amount of excavation required. Special building practices and designs are required to ensure satisfactory performance.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.
- The nature and depth of the soft bedrock in this soil reduces the ease of excavation and increases the difficulty of constructing foundations and installing utilities.

Septic tank absorption fields

- Because of the limited depth to bedrock, this soil is generally unsuitable as a site for septic tank absorption fields.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.
- Because of the slope, designing local roads and streets is difficult.

Interpretive Groups

Land capability classification: 4e
Prime farmland: Not prime farmland
Pasture and hayland suitability group: F-1
Hydric soil: No

XeA—Xenia silt loam, 0 to 2 percent slopes

Setting

Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Xenia soil and similar components: 85 percent
Contrasting components:
  Cyclone soils—6 percent
  Fincastle soils—4 percent
  Morningsun soils—3 percent
  Sugarvalley soils—2 percent

Soil Properties and Qualities

Available water capacity: About 9.3 inches to a depth of 48 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- The root system of winter grain crops may be damaged by frost action.

- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 1
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

XeB—Xenia silt loam, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Xenia soil and similar components: 85 percent
Contrasting components:
Miamian soils—7 percent
Celina soils—5 percent
Morningsun soils—3 percent

Soil Properties and Qualities

Available water capacity: About 10.8 inches to a depth of 58 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.

- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.
- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

XeB2—Xenia silt loam, 2 to 6 percent slopes, eroded

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Shoulders

Map Unit Composition

Xenia soil and similar components: 85 percent
Contrasting components:
    Miamian soils—10 percent
    Celina soils—5 percent

Soil Properties and Qualities

Available water capacity: About 8.2 inches to a depth of 44 inches
Cation-exchange capacity of the surface layer: 5.0 to 19 meq per 100 grams
Depth class: Very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 60 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 0.8 to 2.2 percent
Parent material: Loess and the underlying till
Permeability: Slow
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam
Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- Erosion has removed part of the surface soil, and the remaining surface soil is less productive and more difficult to manage.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.
- Burning may destroy organic matter.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

XfB—Xenia silt loam, bedrock substratum, 2 to 6 percent slopes

Setting

Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits

Map Unit Composition

Xenia soil and similar components: 85 percent
Contrasting components:
  Wynn soils—10 percent
  Cyclone soils—5 percent

Soil Properties and Qualities

Available water capacity: About 8.7 inches to a depth of 46 inches
Cation-exchange capacity of the surface layer: 6.0 to 20 meq per 100 grams
Depth class: Deep or very deep
Depth to root-restrictive feature: Dense material at a depth of 40 to 60 inches; bedrock (paralithic) at a depth of 55 to 65 inches
Depth to the top of the seasonal high water table: 1.5 to 2.5 feet
Water table kind: Perched
Ponding: None
Drainage class: Moderately well drained
Flooding: None
Organic matter content in the surface layer: 1.0 to 3.0 percent
Parent material: Loess and the underlying till over limestone and shale
Permeability: Slow in the till substratum and slow to impermeable in the underlying bedrock
Potential for frost action: High
Shrink-swell potential: Moderate
Surface layer texture: Silt loam

Potential for surface runoff: Low
Wind erosion hazard: Slight

Use and Management Considerations

Cropland

- Grassed waterways can be used in some areas to slow and direct the movement of water and reduce the hazard of erosion.
- Using a system of conservation tillage and planting cover crops reduce the runoff rate and help to minimize soil loss by erosion.
- The root system of winter grain crops may be damaged by frost action.
- Controlling traffic can minimize soil compaction.
- Maintaining or increasing the content of organic matter in the soil helps to prevent crusting, improves tilth, and increases the rate of water infiltration.

Pastureland

- Erosion control is needed when pastures are renovated.
- The root systems of plants may be damaged by frost action.

Woodland

- The low soil strength may lead to the formation of ruts, which can cause unsafe conditions and damage to equipment.
- Because of the low soil strength, the cost of constructing haul roads and log landings is increased.
- Because of the low soil strength, harvesting equipment may be difficult to operate and damage may result. The low soil strength may cause unsafe conditions for log trucks.
- The stickiness of the soil reduces the efficiency of mechanical planting equipment.

Building sites

- Because of the seasonal high water table, the period when excavations can be made may be restricted and a higher degree of construction site development and building maintenance may be required. This soil is poorly suited to building site development, and special design of structures may be needed to prevent the damage caused by wetness.
- The moderate shrinking and swelling of the soil may crack foundations and basement walls. Foundations and other structures may require some special design and construction techniques or maintenance.

Septic tank absorption fields

- The limited depth to bedrock reduces the filtering capacity of the soil and greatly increases the difficulty of properly installing the effluent distribution lines.
- The restricted permeability of this soil limits the absorption and proper treatment of the effluent from septic systems.
- The seasonal high water table greatly limits the absorption and proper treatment of the effluent from septic systems. Costly measures may be needed to lower the water table in the area of the absorption field.

Local roads and streets

- Because of shrinking and swelling, this soil may not be suitable for use as base material for local roads and streets.
- Local roads and streets may be damaged by frost action, which is caused by the freezing and thawing of soil moisture.
- The seasonal high water table affects the ease of excavation and grading and reduces the bearing capacity of the soil.

- This soil has a low bearing strength, which is generally unfavorable for supporting heavy loads. Special design of local roads and streets is needed to prevent the structural damage caused by the low soil strength.

Interpretive Groups

Land capability classification: 2e
Prime farmland: All areas are prime farmland
Pasture and hayland suitability group: A-6
Hydric soil: No

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, slightly limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Interpretive Groups

Interpretive groups are specified land use and specific management groupings that are assigned to soil areas because combinations of soils have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. These groups allow users of soil surveys to plan reasonable alternatives for the use and management of soils.

Table 28 shows the interpretive ratings for land capability classification; pasture and hayland suitability groups; prime farmland; and hydric condition of each soil in the survey area.

Land capability classification is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deterioration over a long period of time. The table shows the land capability class and subclass for each of the soils in Preble County. Additional information on land capability classification is provided under the heading “Land Capability Classification.”

Pasture and hayland suitability groups are composed of soil map units having similar potentials and limitations for forage production. These groups simplify soils information and provide soil and plant science information for planning purposes. Additional information on pasture and hayland suitability groups is provided under the heading “Pasture and Hayland Interpretations.”

The prime farmland classification identifies the most suitable land for producing food, feed, fiber, forage, and oilseed crops. This identification is useful in the management and maintenance of the resource base that supports the productive capacity of Ohio agriculture. The table shows which of the soils in Preble County are prime farmland. Additional information on prime farmland is provided under the heading “Prime Farmland.”

The identification of hydric soils and information about hydrophytic vegetation and wetland hydrology are used to define wetlands. The table shows which of the soils in Preble County are hydric. Additional information on hydric soils is provided under the heading “Hydric Soils.”

Crops and Pasture

Dennis Bunger, District Conservationist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops, pasture, and hayland is suggested in this section. This section also discusses cropland limitations and hazards, pasture and hayland interpretations, the crop yield index, the system of land capability classification, and prime farmland.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Ohio State University Extension.

In 1998, about 195,000 acres in Preble County were used for crops and pasture. Of this total, about 160,000 acres were used for corn and soybeans, 12,000 acres were used for wheat, 8,000 acres were in rotational hay and pasture, and 2,000 acres were used for permanent pasture. The remaining acreage was idle land or was used for specialty crops (mainly orchards, sunflowers, and Christmas trees). Yearly fluctuations

occur in the amount of acreage used for each crop due to the market value and demand of each product. The trend for the future shows a continued increase in corn and soybean acreage and a decrease in wheat, hay, and pasture acreage.

The total acreage used for crops and pasture is gradually decreasing as more and more land is used for urban development. This soil survey can be helpful in making land use decisions that will influence the future role of agriculture in Preble County.

The potential for increased agricultural production is good in the county. Extending the latest crop production technology to all of the cropland in the county can increase this production. The major management needs on the cropland are measures that control erosion, improve drainage, and improve or maintain soil fertility and tilth.

Cropland Management

Erosion is a major problem on much of the cropland in Preble County. It is a hazard on all gently sloping to very steep soils in the county. Loss of part of the surface soil through erosion reduces soil productivity and results in deterioration of tilth. It also reduces the available water capacity of the soil while increasing the amount of sediment, herbicides, and pesticides that enter waterways and streams. The erodibility of a particular soil depends in part on the physical properties of the soil. Many of the soils in Preble County have a surface layer that has a fairly high content of silt, a low or moderate content of organic matter, and a clayey subsoil. For example, Crosby soils that have a high content of silt in the surface layer are more susceptible to erosion than Miamian soils on comparable slopes and under a similar vegetative cover. The hazard of erosion on all soils increases as the percentage of slope increases. In eroded areas, preparing a seedbed and tilling are difficult because part of the original friable surface layer has been removed by erosion. Such areas are common on the eroded Miamian soils.

A protective plant cover increases the rate of water infiltration and reduces the runoff rate and the hazard of erosion. Keeping a plant cover on the soil for extended periods can keep soil losses at a level that will not reduce the productivity of the soil. Including grasses and legumes in the cropping sequence reduces the risk of erosion, increases the supply of nitrogen, and improves soil tilth.

Soil erosion also can be reduced by a tillage method that leaves all of the crop residue on the surface throughout the year or that incorporates part of the residue into the soil. This method of tillage is commonly referred to as conservation tillage and includes no-till planting (fig. 14), ridge-till planting, strip-till planting, and other systems that do not invert the soil but leave a protective amount of crop residue on the soil surface. Minimizing tillage and leaving crop residue on the surface increases the rate of water infiltration and reduces the hazard of erosion. No-till planting of corn and soybeans, which is becoming common on more and more acres in the county, is very effective in controlling erosion on gently sloping and strongly sloping soils.

No-till planting is suitable on many of the soils in the county, especially the well drained soils, such as Fox, Miamian, and Ockley, and the moderately well drained soils, such as Celina and Lewisburg. A good artificial surface and subsurface drainage system is needed if no-till crops are planted on very poorly drained soils, such as Kokomo and Westland. Tillage practices on almost all soils should not be done on the contour because slopes are so short and irregular. Conservation tillage has become the most widely used erosion-control system in Preble County for cropland *(19)*. Other erosion-control practices include terraces, diversions, and grassed waterways.

Terraces and diversions reduce the length of slopes and thus the risk of erosion. Many of the soils in Preble County, however, are not well suited to terraces and diversions because the slopes are irregular, the terrace channels are excessively wet, and/or a clayey subsoil is exposed in the channel following construction.

Grassed waterways are natural or constructed drainage outlets that are protected

Figure 14.—No-till corn in an area of Crosby-Celina silt loams, 0 to 2 percent slopes.

by grass cover. Natural drainageways are the best sites for these waterways, partly because a good channel commonly can be easily crossed with farm machinery. Water- and sediment-control basins can be used as an alternative to grassed waterways. These basins collect surface water behind a low dam, thus reducing the peak flow and trapping sediment. The surface water is released through a subsurface drain. The amount of land taken out of production is typically less where these basins are used as an alternative to a grassed waterway. Grassed waterways are the most common means used to control erosion in natural drainageways (fig. 15).

Information on the design of erosion-control structures for each kind of soil is contained in the "Technical Guide," which is available at the local office of the Natural Resources Conservation Service.

Soil drainage is a major management need on a majority of the soils in Preble County. Crops perform well on naturally wet soils only if the excess water is removed. The wetness results from a seasonal high water table and periodic ponding. All of the very poorly drained or poorly drained soils in the county are subject to ponding. Soils that are not adequately drained dry out and warm up very slowly in the spring. As a result, tillage and planting operations are delayed and maximum yield potentials are reduced. The very poorly drained or poorly drained soils include Cyclone, Kokmo, Lippincott, Mahalasville, Milford, Millsdale, Sloan, and Westland. Crop production is generally not possible on these soils unless an artificial drainage system is installed. Somewhat poorly drained soils, such as Crosby, Fincastle, Randolph, Savona, and Sugarvalley, are naturally so wet that crops are damaged during most years and planting and harvesting is delayed unless an artificial drainage system is installed. Surface drainage and subsurface drainage are the conservation practices used to improve the drainage on these naturally wet soils. The moderately well drained Celina soils and the well drained Miamian soils generally do not need drainage systems. Random subsurface drains may be needed in some soils where they are prone to seeps.

Drainage is a major consideration in managing crops and pasture. Management of

drainage in conformance with regulations influencing wetlands may require special permits and extra planning.

The efficiency of drainage systems varies with the different kinds of soils. As shown in table 23 ("Physical Properties of the Soils"), many of these wet soils have moderately slow or slow permeability. Subsurface drains should be spaced more closely in the more slowly permeable soils. Information concerning subsurface and surface drainage system design for each kind of soil is available at the local office of the Natural Resources Conservation Service.

Protection from flooding is needed on flood plain soils, such as Eel, Medway, Rossburg, Sloan, and Stonelick. Levees can be used in some areas to protect these soils from stream overflow. The risk to crops grown on flood plain soils depends on the frequency and duration of the flooding. Out-of-bank flow on these flood plains can cause severe scour erosion and can deposit such debris as sand, silt, and gravel on the soil surface, thus destroying the soil's natural structure.

Soil fertility is a management concern that affects maximizing the economic return on cropland. It is influenced by soil reaction, pH, and the soil's ability to supply plant nutrients. Many of the upland soils that are light colored are naturally acidic and generally have a supply of plant nutrients that is below optimum. Most of the dark-colored soils, such as Cyclone and Kokomo, are nearly neutral in reaction and contain moderate amounts of potassium. These soils are higher in organic matter than the light-colored soils, such as Crosby and Kendallville, and generally are more productive. The flood plain soils commonly have a neutral or slightly alkaline surface layer and are naturally higher in content of plant nutrients than most of the upland soils. Generally, the productivity of the flood plain soils is comparable to or slightly less than the dark-colored soils when all management needs are addressed. On all soils, additions of lime and fertilizer should be based upon the results of soil tests, on the needs of the crop, and on realistic yield goals. Commercial fertilizer, animal manures, and municipal sludge can be used as sources of nutrients. Traditional broadcast applications of lime and fertilizer consist of using one rate for the entire field. Since the majority of the crop fields contain several different soils, variable rate application of nutrients, based on

Figure 15.—A grassed waterway in an area of Kokomo silt loam, 0 to 1 percent slopes, helps to minimize erosion. Soybeans are planted in an area of Crosby-Celina silt loams, 0 to 2 percent slopes.

site-specific information and soil yield potentials, may be the preferred method in both agronomic and economic terms.

Soil tilth is another important factor affecting the germination of seeds, root development, plant growth, and the infiltration of water into the soil. Soils with good tilth are friable and porous. Soil tilth is the physical condition of a soil, and it includes soil structure and soil consistence. Soil tilth is a measure of a soil's ability to provide for the storage and flow of soil water and air and to provide structural support for farming operations.

Root growth, biological activity, water infiltration, water-holding capacity, and seedling germination are enhanced in soils that have good tilth. Most of the soils used for crop production in Preble County have a surface layer of light-colored silt loam that is moderate or moderately low in organic matter content. Generally, the structure of these soils is weak. Tilth in such soils may generally be adequate, but a crust forms on the soil surface during periods of intensive rainfall. The crust is hard when dry and nearly impervious to water. As a result, it reduces the rate of water infiltration, increases the runoff rate, and hinders plant root and shoot growth. Soil crusts generally result in poor seed germination and poor emergence due to the dry, hard surface layer.

Additions of crop residue, barnyard manure, or other organic material and conservation tillage that promotes increased organic matter content help to improve tilth and minimize crusting. If excessive tillage buries crop residue in light-colored soils, these soils dry out quickly and the likelihood of crusting is increased. Soils that are no-till planted typically remain moister than tilled soils because the crop residue left on the soil surface minimizes crusting.

Fall plowing is generally not suitable on the light-colored soils that have a silt loam surface layer because of a crust that forms in winter and spring. Many of the soils that are fall tilled are nearly as hard and dense at planting time as they were before they were fall tilled. Fall tillage is common on the poorly drained or very poorly drained, dark-colored soils, such as Cyclone, Kokomo, and Westland. Conservation tillage is common on the light-colored soils, such as Miamian, and on soils that have more than 3 percent slopes because of the erosion hazard. Using conservation tillage, and no-till planting in particular, on the steeper soils minimizes soil erosion by protecting the soil's surface with crop and plant residues. Crop residue kept near the soil surface helps maintain or improve soil organic matter and promotes optimum soil moisture conditions, thereby improving soil tilth.

Cropland Limitations and Hazards

The soils of the survey area are rated in table 5 according to limitations that affect their suitability for growing corn, soybeans, and wheat. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect production of corn, soybeans, and wheat. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate

gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, available water, root-restrictive layers, erosion, and tilth. Susceptibility to flooding is considered. Soils that are subject to flooding are limited for cropland by the duration and intensity of flooding and the season when flooding occurs.

The main concerns affecting the management of nonirrigated cropland are controlling flooding, soil blowing, and water erosion; preventing ground-water pollution; removing excess water; minimizing surface crusting; minimizing compaction; and maintaining soil tilth, the content of organic matter, and fertility.

Generally, a combination of several practices is needed to control soil blowing and water erosion. Conservation tillage, stripcropping, field windbreaks, tall grass barriers, contour farming, conservation cropping systems, crop residue management, diversions, and grassed waterways help to prevent excessive soil loss.

The information in table 5 can be supplemented by other information in this survey, for example, the information in table 7 on crop yield index.

Corn and soybeans require soils that are not ponded or flooded for brief periods in the spring and late fall or for long periods during the summer and early fall. The soil properties that affect the growth of corn and soybeans are depth to bedrock, dense till, sand and gravel, or a fragipan; clay content; permeability; surface crusting; compaction; a seasonal high water table; available water capacity; and organic matter content. Other factors that influence production of corn and soybeans include slope, erosion, tilth, and the potential for ground-water pollution.

Wheat is susceptible to damage from frost heave in the fall and early spring. Wheat can be damaged by flooding or ponding in fall and spring. The soil properties that affect the growth of wheat are depth to bedrock, dense till, sand and gravel, or a fragipan; clay content; permeability; surface crusting; compaction; a seasonal high water table; and available water capacity. Other factors that influence production of wheat include slope, erosion, tilth, and potential for ground-water pollution.

Surface drainage or subsurface drainage, or both, are used to remove excess water, lower the seasonal high water table, and minimize ponding. A surface crust forms in tilled areas after hard rains and may inhibit seedling emergence. Regular additions of crop residue, manure, or other organic materials help to improve soil structure and minimize crusting. Tilling within the proper range in moisture content minimizes compaction.

Measures that are effective in maintaining soil tilth, organic matter, and fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the limitations and hazards shown in the table cannot be easily overcome. These are *flooding, ponding, slope,* and *depth to bedrock*.

Flooding.—Flooding can damage winter grain and forage crops. A tillage method that partly covers crop residue and leaves a rough or ridged surface helps to prevent removal of crop residue by floodwater. Tilling and planting should be delayed in the spring until flooding is no longer a hazard.

Ponding.—Surface drains help to remove excess surface water and prevent damage from ponding.

Slope.—Where the slope is more than 25 percent, water erosion is excessive. The selection of crops and the use of equipment are limited. Cultivation may be restricted.

Depth to bedrock.—Rooting depth and available moisture may be limited by bedrock within a depth of 40 inches.

Additional limitations and hazards are as follows:

Potential for ground-water pollution.—This is a hazard in soils that have excessive permeability, are moderately deep or shallow over bedrock, or have a high water table.

Limited available water capacity, poor tilth, restricted permeability, and *surface crusting*.—These limitations can be partially overcome by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems.

Wind erosion.—This is a hazard for some soils in the survey area. Wind can remove a significant amount of soil, and the particles carried by the wind can act as an abrasive on leaves and other tissues. The hazard of wind erosion can be reduced by maintaining vegetative cover and planting windbreaks and by controlling the water table in areas of muck soil.

Frost action.—Frost action can damage deep-rooted legumes and some small grains.

Sandy layers.—Deep leaching of nutrients and pesticides may occur in sandy layers. Crops generally respond better to smaller, more frequent applications of fertilizer and lime than to one large application.

Clodding.—Clods may inhibit germination, reduce water infiltration, and increase runoff.

Subsidence of muck.—Subsidence or shrinking occurs as a result of oxidation in the muck after the soil is drained. Control of the water table by subirrigation through subsurface drain lines reduces the hazards of subsidence, burning, and soil blowing.

High clay content.—The high clay content in the soil reduces rooting depth and limits water movement.

Root-restrictive layer.—Root-restrictive layers limit root growth and water movement.

Excessive alkalinity.—A high pH in the upper part of the soil may inhibit plant growth and reduce availability of potassium and micronutrients.

Excessive acidity.—A low pH in the upper part of the soil may increase concentrations of aluminum and manganese and may injure plants.

Gravelly surface.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Stony surface.—Stones or boulders on the surface can hinder normal tillage unless they are removed.

The following is an explanation of the criteria used to determine the limitations or hazards for cropland.

Areas of rock outcrop.—Rock outcrop is a named component of the map unit.

Areas of rubble land.—Rubble land is a named component of the map unit.

Areas of slick spots.—Slick spots are a named component of the map unit.

Channeled.—The word “channeled” is included in the name of the map unit.

Easily eroded.—The surface K factor multiplied by the relative value of the slope is more than 2 (same as prime farmland criteria).

Erosion hazard.—The relative value of the slope is greater than 2.

Frequent flooding.—The component of the map unit is frequently flooded.

Occasional flooding.—The component of the map unit is occasionally flooded.

Gullied.—The word “gullied” is included in the name of the map unit.

Lack of timely precipitation.—The component of the map unit has a Xeric moisture regime. The amount of annual precipitation is no more than 14 inches.

Lime content.—The component is assigned to wind erodibility group 4L or has more than 5 percent lime in the upper 10 inches.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Ponding.—Ponding duration is assigned to the component of the map unit.

Ponded for extended periods.—A ponding duration of very long is assigned to the component of the map unit.

Gravelly surface.—The surface texture has a flaggy, very flaggy, extremely flaggy, very gravelly, extremely gravelly, or very channery modifier.

Stony surface.—The surface texture has a bouldery, very bouldery, extremely bouldery, stony, very stony, extremely stony, cobbly, very cobbly, or extremely cobbly modifier.

Sandy layers.—The family particle size is sandy, sandy or sandy-skeletal, sandy over loamy, sandy over clayey, sandy-skeletal, sandy-skeletal over clayey, or sandy-skeletal over loamy; or the subgroup is Arenic or Psammentic; or the suborder is Psamments.

Depth to bedrock.—Bedrock is at a depth of less than 40 inches.

High potential for ground-water pollution.—Hard bedrock is within a depth of 40 inches, or permeability is more than 6 inches per hour in some layer within a depth of 80 inches and is not 0.2 inch per hour or less in some layer within that depth.

Moderate potential for ground-water pollution.—An apparent water table is within a depth of 4 feet, or permeability is moderately rapid in some layer between depths of 24 and 60 inches and is not 0.2 inch per hour or less in some layer within a depth of 80 inches.

Poor tilth.—The component of the map unit is severely eroded, has less than 1 percent organic matter in the surface layer, or has 35 percent or more clay in the surface layer.

Fair tilth.—The component of the map unit has a surface layer of silty clay loam or clay loam and has less than 35 percent clay, or it is moderately eroded and has a surface layer of silt loam or loam.

Excessive acidity.—The upper range of the soil pH is less than 4.5 within a depth of 40 inches.

Excessive alkalinity.—The lower range of the soil pH is more than 7.9 within a depth of 40 inches.

Restricted permeability.—Permeability is 0.06 inch per hour or less within a depth of 40 inches, and a seasonal high water table is within a depth of 18 inches.

Seasonal high water table.—The seasonal high water table is within a depth of 1.5 feet.

Salt content.—The component of the map unit has an electrical conductivity of more than 4 in the surface layer or more than 8 within a depth of 30 inches.

Short frost-free season.—The map unit has a growing season of less than 90 frost-free days.

Excessive slope.—The upper slope range of the component of the map unit is more than 25 percent.

Sodium content.—The sodium adsorption ratio of the component of the map unit is more than 13 within a depth of 30 inches.

Soil blowing.—The wind erodibility index multiplied by the selected high C factor for the survey area and then divided by the T factor is more than 8 for the component of the map unit.

Surface crusting.—The organic matter content of the surface layer is less than or equal to 3 percent, and the texture is silt loam or silty clay loam.

Surface compaction.—The component of the map unit has a surface layer of silt loam, silty clay loam, clay loam, clay, or silty clay.

Frost action.—The component of the map unit has a high potential for frost action.

Part of surface removed.—The surface layer of the component of the map unit is moderately eroded.

Most of surface removed.—The surface layer of the component of the map unit is severely eroded.

Figure 16.—Pasture in an area of Xenia silt loam, 2 to 6 percent slopes. In the background is the Camden Moraine and an area of Miamian silt loam, 6 to 12 percent slopes, eroded.

Subsidence of muck.—The organic matter content of the surface layer of the component of the map unit is greater than or equal to 20 percent.

Wind erosion.—The upper range of the slope is less than or equal to 25 percent, and the wind erodibility group is 1, 2, or 3.

Clodding.—The relative value of the total clay in the surface layer is greater than 32 percent.

Root-restrictive layer.—A fragipan or dense material is within a depth of 40 inches.

High clay content.—A layer within a depth of 40 inches has a clay content that averages between 40 and 60 percent.

Very high clay content.—A layer within a depth of 40 inches has a clay content that averages more than 60 percent.

Pasture and Hayland Management

Permanent pasture makes up approximately 6 percent of the farmland in Preble County. Hayland, in rotation with other crops, makes up an additional 5 percent of the farmland *(19, 21, 33, 35)*. The acres of permanent pasture and hayland have decreased by approximately 50 percent between 1982 and 1997. This decrease is attributed mainly to a larger acreage of corn and soybeans, more livestock in feedlots on fewer farms, fewer dairy livestock, and increasing pressure for homesite and urban development in rural areas.

Much of the permanent pasture is located on the more sloping land, in irregularly shaped areas unsuitable for row crop farming, and on occasionally flooded soils (fig. 16). Open woodlots also are pastured, but they generally provide poor-quality grazing because the cover of forage plants is sparse.

Pastures dominantly consist of cool-season grasses, such as bluegrass, orchardgrass, tall fescue, and timothy. Hayland typically consists of a grass and legume mixture or a pure alfalfa stand.

Most pastures are unimproved and have been overgrazed and treated with little or no management. The result is weedy and, in some areas, brushy low-producing

pastures that are more subject to increased erosion because of the sparse vegetative cover. Better nutrient management, pest control, and improved grazing management can in time restore these pastures to a more productive condition.

Most of the soils in Preble County can be used for high-quality permanent pasture. The gently sloping to steep soils, such as Miamian and Milton, are moderately eroded and are typically low in fertility. Soil erosion is greatest on these moderately sloping to steep soils. Also, less water is available to plants because surface runoff is rapid or very rapid. Recommended applications of fertilizer and lime can stimulate plant growth and vigor, thus increasing productivity.

Forage growth on gently sloping soils, such as Celina, Crosby, and Miamian, is generally good. The well drained or moderately well drained flood plain soils, such as Ross and Medway, are well suited to permanent pastures. These soils are naturally high in fertility and have a low erosion hazard, and the flooding risk is typically greatest during late winter or early spring, before grazing or forage harvesting begins.

The fertility levels of pasture and hayland should be maintained or improved according to current soil tests. This helps to ensure good productivity and lengthen the life of the forage stand. Weeds and brush need to be controlled by mowing, clipping, or spraying, which reduces unwanted species infestation.

Many permanent pasture fields are infested with multiflora rose. Multiflora rose greatly reduces the ability of the pasture field to produce while decreasing the harvesting and grazing potential. If not treated, multiflora rose can completely overtake a pasture field.

The control of such insects as the alfalfa weevil and potato leaf hopper is essential for the production of high-quality forage. Timely mowing or harvesting, the selection of resistant or tolerant plant varieties, and the use of pesticides help to control these insects.

Timely harvesting and managed grazing are essential for the production of high-quality forage, stand survival, and erosion control. Managed intensive grazing, or MIG, is a grazing system that uses many small areas or paddocks having different plant varieties or species among which the livestock is rotated. The livestock completely graze an area, but do not overgraze, before being moved into another area. This system, although more management intensive, has been found to produce more forage, lengthen the grazing period, quicken forage recovery, and minimize soil erosion. This system can adapt to any soil suitable for pastureland but shows the greatest agronomic and erosion-control benefits on the more sloping, well drained, erosion-prone soils, such as Fox and Miamian.

Pasture and Hayland Interpretations

Soils are assigned to pasture and hayland groups according to their suitability for the production of forage. The soils in each group are similar enough to be suited to the same species of grasses or legumes, have similar limitations and hazards, require similar management, and have similar productivity levels and other responses to management.

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotational grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 6 lists the pasture and hayland suitability group symbol for each soil. Soils assigned the same suitability group symbol require the same general management

and have about the same potential productivity. The pasture and hayland suitability groups are based on soil characteristics and limitations.

Table 6 can be used by farmers, farm managers, conservationists, extension agents, and crop consultants in planning the use of soils for pasture and hay crops. Soils on slopes greater than 25 percent are generally not recommended for pasture or hayland.

Soils assigned to group A have few limitations affecting the management and growth of climatically adapted plants. Those assigned to group A-1 are deep or very deep and well drained or moderately well drained. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent. Plants on these soils respond well to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH level in the subsoil shortens the life of some deep-rooted legumes.

Soils in group A-2 are deep or very deep and well drained or moderately well drained. The available water capacity ranges from moderate to very high. Plants on these soils respond well to additions of lime. Frequent applications may be needed to maintain an adequate pH level. A low pH level in the subsoil shortens the life of some deep-rooted legumes. Slopes range from 18 to 25 percent. The slope may interfere with clipping, mowing, and spraying for weed control. The slope increases the risk of erosion if the pasture is overgrazed or cultivated for reseeding. These soils are suited to no-till reseeding and interseeding.

Soils in group A-3 are deep or very deep and well drained or moderately well drained. The available water capacity ranges from moderate to very high. Slopes range from 25 to 40 percent. These soils are not suited to pasture or hay, but some grass pasture is produced.

Soils in group A-4 are deep or very deep and well drained or moderately well drained. They have stones or boulders on the surface that are extensive enough to preclude the use of hay making equipment. Slopes range from 0 to 40 percent.

Soils in group A-5 are well drained or moderately well drained and are subject to flooding. Grazing is limited during periods of stream overflow. The floodwater deposits sediments which lower the quality of the forage. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent.

Soils in group A-6 are deep or very deep, are well drained or moderately well drained, and are subject to frost action, which can damage legumes. Mixing fibrous-rooted grasses with the legumes and practicing good grazing management minimize the damage caused by frost action. The available water capacity ranges from moderate to very high. Slopes range from 0 to 18 percent.

Soils in group B are limited because of droughtiness. Soils in group B-1 are deep or very deep and well drained or moderately well drained. The available water capacity is low or very low and limits forage growth and production. Slopes range from 0 to 25 percent.

Soils in group B-2 are deep or very deep and well drained or moderately well drained. The available water capacity is low or very low and limits forage growth and production. Slopes range from 25 to 40 percent.

Soils in group B-3 are somewhat poorly drained to well drained soils and are subject to flooding. Slopes range from 0 to 6 percent.

Soils in group B-4 are deep or very deep, well drained or moderately well drained reclaimed mine soils. The available water capacity is low or very low. Slopes range from 0 to 25 percent. The substratum contains a high percentage of rock fragments. The rooting zone is 20 to 30 inches deep.

Soils in group C are wet because of a seasonal high water. Soils in group C-1 are deep or very deep and somewhat poorly drained, poorly drained, or very poorly

drained. These soils normally respond well to subsurface drainage. Slopes range from 0 to 12 percent.

Soils in group C-2 are deep or very deep and somewhat poorly drained, poorly drained, or very poorly drained. The seasonal high water table limits the rooting depth of deep-rooted forage plants. Shallow-rooted species grow best on these soils. Subsurface drains are used to lower the seasonal high water table. The effectiveness of subsurface drainage is typically limited by the permeability of the subsoil, high amounts of clay in the subsoil, or a fragipan. Because of the limited root zone, these soils are better suited to forage species that do not have a taproot than to other species. Slopes range from 0 to 12 percent.

Soils in group C-3 are somewhat poorly drained, poorly drained, or very poorly drained and are subject to flooding. Grazing is limited during periods of stream overflow. The available water capacity ranges from moderate to very high. Slopes range from 0 to 6 percent. The seasonal high water table limits the rooting depth of forage plants. Shallow-rooted species grow best on these soils.

Soils in group D have a high content of organic matter. Soils in group D-1 formed entirely or partially in organic material. Slopes range from 0 to 2 percent.

Soils in group E are shallow. The root zone is less than 20 inches deep. Soils in group E-1 are shallow or very shallow. The available water capacity is low or very low. It restricts forage production. These soils are well suited to native warm-season grasses. Slopes range from 0 to 25 percent.

Soils in group E-2 are shallow or very shallow or have a high bulk density and cobbles and stones in the upper part. The available water capacity is low or very low. Slopes range from 25 to 40 percent. Shallow-rooted species should be selected for planting in areas of these soils.

Soils in group E-3 have a high bulk density and cobbles and stones in the upper part. The available water capacity is low or very low. Slopes range from 0 to 25 percent.

Soils in group F have a root zone that extends to a depth of 20 to 40 inches. These soils are better suited to forage species that do not have a taproot than to other species. Soils in group F-1 are moderately deep and well drained or moderately well drained. Slopes range from 0 to 25 percent.

Soils in group F-2 are moderately deep and well drained or moderately well drained. Slopes range from 25 to 40 percent. These soils generally are not suited to hay.

Soils in group F-3 are well drained or moderately well drained and are moderately deep to a fragipan. Slopes range from 0 to 25 percent.

Soils in group F-4 are well drained or moderately well drained and are moderately deep to a fragipan. Slopes range from 25 to 40 percent.

Soils in group F-5 are well drained or moderately well drained. They have a high bulk density, a high clay content, slow permeability, or a combination of these factors in the subsoil, all of which restrict rooting depth. Slopes range from 0 to 25 percent.

Soils in group F-6 are well drained or moderately well drained. They have a high bulk density, a high clay content, slow permeability, or a combination of these factors in the subsoil, all of which restrict rooting depth. Slopes range from 25 to 40 percent.

Soils in group F-7 are somewhat poorly drained, poorly drained, or very poorly drained. They have a high clay content and very slow permeability in the subsoil, which restrict rooting depth. Slopes range from 0 to 12 percent.

Soils in group G have chemical properties that are unfavorable for many climatically adapted plants. Soils in group G-1 are well drained or moderately well drained and are shallow or moderately deep to toxic spoil from surface mining operations. The available water capacity is low or very low in the root zone. Slopes range from 0 to 25 percent.

Soils in group G-2 are well drained or moderately well drained. They are shallow or moderately deep to toxic spoil from surface mining operations. Slopes range from 25 to 40 percent.

Soils in group H are toxic or too steep for forage production. Soils in group H-1 consist of toxic materials from surface mining operations, or they are on slopes greater than or equal to 40 percent. These soils generally are unsuited to pasture and hay.

Crop Yield Index

Table 7 lists the crop yield indices for soils in Preble County. The yield index reflects the yield potential of a soil in relation to other soils in the county. It is based on the most productive soil(s)—Cyclone for corn and soybeans and Corwin for winter wheat. These soils receive a rating of 100. Other soils are ranked against this standard.

The yields used to calculate the index values are based on using good management practices.

To calculate estimated yields, use the yield index number as a percentage and multiply it by the crop yield in the table header. For example, to calculate estimated corn yield for map unit EgB, multiply .70 by the corn yield in the header, which is 160. Therefore, .70 x 160 = 112 bushels of corn estimated for map unit EgB.

To use this yield index in the future to calculate estimated yields, use current yield data.

Additional information on calculating estimated yields can be obtained from the local office of the Natural Resources Conservation Service or the Ohio State University Extension.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management *(34)*. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only capability class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, woodland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, woodland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, woodland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class or subclass is shown in table 8. The capability classification of map units in this survey area is given in the section “Detailed Soil Map Units” and in table 28.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, woodland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 216,800 acres in the county, or about 79 percent of the total acreage in the county, meets the soil requirements for prime farmland as defined by the Natural Resources Conservation Service. Preble County consists of dominantly prime farmland soils; however, small areas of soils that do not meet the requirements for prime farmland are scattered throughout the county.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 9 and table 28. These lists do not constitute a recommendation for a particular land use. On some soils included in the lists, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is

shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units.”

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high-quality crop when treated and managed by acceptable farming methods. Examples of such crops are tree fruits, berries, and vegetables.

Unique farmland has an adequate supply of available moisture for the specific crops for which it is used because of stored moisture, precipitation, or irrigation and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and others.

Additional Farmland of Statewide Importance

Some areas other than areas of prime farmland and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate State agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states additional farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

Additional Farmland of Local Importance

This land consists of areas that are of local importance in the production of food, feed, fiber, forage, and oilseed crops and are not identified as having national or statewide importance. Where appropriate, this land is identified by local agencies. It may include tracts of land that have been designated for agriculture by local ordinance.

Lists of this land are developed as needed in cooperation with conservation districts and others.

Hydric Soils

In this section, hydric soils are defined and described. The hydric soils in the survey area are listed in table 10 and are also identified in table 28.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology *(8, 18, 26, 27)*. Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part *(11)*. These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with

wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established *(12)*. These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” *(31)* and “Keys to Soil Taxonomy” *(32)* and in the “Soil Survey Manual” *(36)*.

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” *(16).*

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The map units in table 10 meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site *(16, 18)*.

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The map units in table 11, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

Woodland Management and Productivity

Chris Hodgson, Service Forester, Ohio Department of Natural Resources, Division of Forestry, helped prepare this section.

Before the early settlers arrived, the survey area was almost entirely covered with a mixed hardwood forest. After almost 200 years of woodland clearing and development, only 25,000 acres, or 10 percent of Preble County, remains wooded *(9)*.

Most of the county’s forests are owned by non-industrial forest owners. Approximately 1,972 acres, in Hueston Woods State Park and Rush Run Wildlife Area, are publicly owned by the Ohio Department of Natural Resources.

Preble County’s forest cover is generally located along major creeks, intermittent streams, and drainageways. These riparian forests serve as buffers, filtering sediment from adjoining crop fields and thus protecting water quality. The lower reaches of Seven Mile, Four Mile, and Twin Creeks contain the largest blocks of contiguous forest cover due to the steep slopes adjacent to these watercourses. Small isolated woodlands are scattered throughout the county’s western townships. They are typically located on poorly drained sites or on areas of a farm that have poor accessibility *(9)*.

For silvicultural discussions, three major type groups are recognized in the survey area. These are: (1) Mixed Hardwoods, (2) Elm-Ash-Maple, and (3) Eastern Red Cedar. These are three of the five major type groups found throughout the Central Region of the United States *(4, 6, 10, 29)*.

The Mixed Hardwoods type group is often called Mixed Mesophytic. The principal species are sugar maple, beech, elm, ash, and yellow-poplar. Associated species include basswood, black walnut, oak, and hickory *(4, 6, 10)*.

The Elm-Ash-Maple type group, which is often called Bottomland Hardwoods, occurs along major streams in the county. Tree species within this group include American elm, red maple, silver maple, cottonwood, sycamore, and box elder. Green ash, willow, black walnut, and mixed oaks are minor components of the forest cover.

The Eastern Red Cedar type group is of small economic significance in Preble County. Red cedar occurs in either poor stands or is mixed with hardwoods in Gratis and Somers Townships. Sites which are severely eroded, slightly acidic, and infertile are well suited to the establishment of red cedar.

The variability of woodland composition and productivity is largely influenced by soils. The factors that influence tree growth are similar to those influencing the production of annual crops and pasture. The major difference is that tree roots extend deeper into the subsoil, utilizing areas between rock fragments. Soil depths, soil texture, fertility, slope, and past erosion are major components impacting tree growth and woodland development *(7)*.

Site index is a measurement of soil's forest productivity. It is based on the height growth which average dominant trees attain on different soil types at an arbitrary standard age *(7, 29)*. For the Central Hardwood region, the standard age is 50. For example, when a soil type has a site index of 80, the average dominant trees will attain a height of 80 feet at age 50. Obviously, the higher the site index, the more productive the soil.

In the past, timber stands were abused from indiscriminate logging practices. High grading was a common harvesting practice. Under this practice, only the high-quality and valuable species were cut from the stand. Poorly formed trees, low-quality trees, hollow trees, and tree species of non-merchantable value were left in the woods. These culls provided the seed for the next generation of trees, and often their inferior genetic characteristics were proliferated.

Woodlands in the county were commonly pastured. This practice was and still is detrimental to forest health. Grazing compacts the soil, destroys herbaceous plants and tree seedlings, and degrades the commercial value of the sawtimber. As a result, the natural succession of plant communities is disrupted and trees become predisposed to insects and disease.

Good timber management and silvicultural timber harvesting can be attained by the use of timber stand improvement, (TSI), and by implementing acceptable harvesting methods. TSI practices involve thinning and controlling vines and are applied to younger stands as an intermediate cut. Harvesting systems, such as clearcuts or selection cuts, dictate how the forest regenerates and with which species it regenerates. The use of these systems depends on timber stand age, timber type, quality and condition of the trees, soil type, and aspect of the growing site.

Soil erosion is a concern when harvesting timber. Potential problem areas are skid trails, logging roads, and staging areas. Poorly designed logging roads and stream crossings contribute to erosion and the siltation of creeks. Best Management Practices (BMPs) may include constructing water bars on steep logging roads and seeding down roads and landings upon completion of the harvest.

Recent trends indicate an increased interest in tree planting in Preble County. White pine is the preferred conifer species since it is well suited to most soil types in the county. Black walnut, red oak, and ash are being planted on the better sites. Reforestation projects generally involve small acreages that are either too small to be used as crop fields or are inaccessible to farm equipment. As the county continues to develop housing, tree planting is a plausible land use for tracts containing less than 10 acres.

All trees have specific site requirements. Planting trees off site impacts survival and

growth rates. Many of the soils in Preble County can produce more and better quality wood products than are currently being produced. A general knowledge of forest management practices and a willingness to implement the methods will enhance timber growth and quality and control forest competition. The Ohio Department of Natural Resources, Division of Forestry; the Ohio State University Extension; and the Natural Resources Conservation Service are just a few agencies which provide woodland management information.

The tables in this section can help woodland owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of woodland management.

Woodland Management

In table 12, parts I through III, interpretive ratings are given for various aspects of woodland management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified woodland management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified woodland management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for woodland management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available at the local office of the Natural Resources Conservation Service or on the Internet.

Ratings in the column *erosion hazard* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture

regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of woodland equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *harvest equipment operability* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for site preparation* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Woodland Productivity

In table 13, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the “National Forestry Manual,” which is available at the local office of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most

important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Windbreaks and Environmental Plantings

Farm and homestead windbreaks are rows of trees or shrubs established adjacent to farm buildings, feedlots, and homes. These windbreaks are usually planted perpendicular to the prevailing winter wind. Planting multiple rows of various species provides the best protection from winds and results in more varied wildlife habitat. Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 14 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in the table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service; the Ohio Department of Natural Resources, Division of Forestry; or the Ohio State University Extension or from a commercial nursery.

Landscape Plantings

Information about the relationship between soils and the selection of landscaping materials helps the user save money by preventing plant loss. Because landscaping design is an individual preference and the list of landscaping materials grows yearly, only four major soil characteristics that most affect plant selection are discussed in this section. These soil characteristics are texture, drainage, available water capacity (AWC), and the reaction of the subsoil. The land user can find this information in the detailed soil map unit descriptions and in the series descriptions. The land user can then consult a horticulturist and, with the aid of the tables on woodland and windbreak and environmental plantings, determine which plants are best suited to a given site.

Texture refers to the percentage of sand, silt, and clay in the subsoil. Generally, soils that have less than 40 percent clay and have a low content of rock fragments or gravel provide the best environment for root development.

Drainage is primarily determined by the soil’s position on the landscape. Much of the rain water and snow melt runs off the higher or more sloping, better drained areas onto the lower and/or flatter areas. A well drained soil typically has yellowish or brown colors and few or no gray-colored areas. The wetter the soil, the higher the percentage of gray colors. A poorly drained or very poorly drained soil is dominantly gray. Subsurface drainage can help lower the water table, but installation may not be possible and maintenance can be costly. In soils that have a shallow water table, the plants most likely to grow well are wetland plants.

Available water capacity (AWC) is simply the capacity of the soil to hold water and make it available for use by most plants. AWC is measured to a depth of 60 inches or to the depth of a root-limiting layer. A root-limiting layer is bedrock, dense glacial till, sand and gravel, or a fragipan. Generally, the shallower the root limiting layer, the lower

Figure 17.—Hueston Woods State Park Lodge overlooking Acton Lake. The lodge is in areas of Miamian silt loam, 6 to 12 percent slopes, eroded, and Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded.

the AWC. For soils that have a low or moderately low AWC, plants that tolerate droughty conditions should be selected.

The acidity or alkalinity (pH) of the subsoil is the fourth major characteristic affecting plant selection. While the pH of the surface layer can be modified relatively easily by the addition of lime or sulfur, it is almost impossible to alter the pH of the subsoil. While many plants grow well with a wide range in pH, some plants, such as azaleas and rhododendrons, require an acid subsoil.

Recreational Development

Preble County has many recreational areas. Hueston Woods State Park is located in the southwestern corner of the county and consists of 3,596 acres of land and 625 acres of water. The excellent facilities at the park provide a variety of recreational opportunities (fig. 17).

Rush Run Wildlife Area is also located in the southern part of the county. It covers an area of rolling terrain, woodland, and grassland, an excellent area for wildlife habitat. Rush Run Lake offers water-recreation opportunities. There are numerous city parks and golf courses throughout the county. The county also has some historical points of interest, such as Fort Saint Clair, which was erected in 1791-1792. In addition, the county has numerous covered bridges, including Roberts Bridge, built in 1829. Roberts Bridge is the oldest and only remaining “double barrelled” covered bridge in the State of Ohio and one of only six standing in the United States. Other attractions include the Preble County Historical Society and the Fine Arts Center *(20)*.

The soils of the survey area are rated in table 15, parts I and II, according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has

features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in table 15 can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a fragipan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a fragipan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a fragipan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of

Figure 18.—A golf course in an area of Russell-Miamian silt loams, 2 to 6 percent slopes, in the Hueston Woods State Park.

vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a fragipan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic (fig. 18). Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a fragipan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Heidi C. K. Devine, Private Lands Wildlife Biologist, Ohio Department of Natural Resources, Division of Wildlife, helped prepare this section.

In Preble County, a wide variety of wildlife is supported by diverse habitat types, including cropland, openland, woodland, wetland, and various bodies of water (such as lakes, ponds, and streams). The soils influence land use and, therefore, also influence wildlife habitat. Slope, productivity potential, texture, depth, and drainage of the soil determine how the land is used. The land use determines the availability of wildlife habitat. Species such as bobwhite quail, cottontail rabbit, meadowlark, and bobolink that were once very common in the survey area are no longer as plentiful due to changing land uses, such as more intense farming on productive soils. However, the abandonment of marginal farmland has resulted in an increase of brushland and forest. The resulting habitat has been beneficial to deer, raccoons, squirrels, woodpeckers, and woodland songbirds. The county was also stocked with wild turkeys during the 1990's.

Soil erosion caused by intensive agriculture and land development continues to be a problem in the county. This results in habitat degradation in the county's lakes, ponds, wetlands, and streams. Such erosion needs to be controlled if these bodies of water are to continue to provide aquatic wildlife habitat and public recreation.

If properly managed, the soils in the county can provide food and shelter for wildlife. Large areas of diverse habitat types provide the greatest variety of wildlife species for a given place.

Habitat for wetland wildlife can be developed in undrained depressions on uplands and in old stream meanders of flood plains. Ponds also can be used as habitat for wetland wildlife. Special plantings help to attract waterfowl. Surface or subsurface drainage systems can be interrupted in such a way as to restore drained wetlands yet maintain the surrounding agricultural land. Farmed hydric soils often have good potential for wetland restoration.

The major riparian areas in the county are along streams. The dominant soils in these areas include Eel, Medway, Rossburg, Sloan, and Stonelick soils. Stabilizing streambanks, erecting nest boxes for wood ducks, and planting trees and shrubs can improve the riparian habitat.

Habitat for openland wildlife can be developed in eroded areas, such as marginal or abandoned pastures and cropland, by planting mixtures of meadow plants or shrubs that provide food, shelter, and nesting areas. Mowing meadows after the nesting season ensures higher survival rates. A good plant cover helps to control erosion.

Woodlots can be improved as habitat for woodland wildlife by maintaining den trees and trees that produce nuts and berries. Plantings along streams or in corridors connecting two or more wooded tracts improve habitat for woodland species. Woodland is often the best use for marginal cropland, abandoned pastures, and land too steep for development.

Active cropland has benefits to wildlife if properly managed. Unplowed fields provide waste grain for food. Grain or legume food plots can be planted in odd corners along woods or fence rows or on ground that may be idle for one or more growing seasons. Hayfields provide loafing areas and feeding sites and may also provide nesting cover if mowing is timed to benefit wildlife.

Creating special habitat through the use of artificial nesting structures, feeding stations, food patches, and wildflowers can attract many different kinds of songbirds. Additional information about improving wildlife habitat can be obtained from the local office of the Natural Resources Conservation Service or the Ohio Department of Natural Resources, Division of Wildlife.

Soils affect the kind and amount of vegetation that is available to wildlife as food and

cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting the appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 16, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat *(1)*.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, soybeans, rye, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, bromegrass, clover, timothy, orchardgrass, crown vetch, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, indiangrass, poverty grass, lambsquarters, wildrye, and sensitive fern.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, raspberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are American plum, redosier dogwood, serviceberry, viburnum, and crabapple.

Coniferous plants furnish cover, browse, and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, hemlock, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and

features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, bulrushes, arrowhead, cattails, waterplantain, wild millet, swamp milkweed, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for construction materials, building site development, sanitary facilities, agricultural waste management, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Construction Materials

Table 17, parts I and II, give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 17, part I, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair,* or *poor* as potential sources of reclamation material, roadfill, and topsoil. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road

embankments in another place. In table 17, part II, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a fragipan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Table 18, parts I and II, show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties

that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a fragipan, hardness of bedrock or a fragipan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a fragipan, hardness of bedrock or a fragipan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a fragipan, hardness of bedrock or a fragipan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a fragipan, hardness of bedrock or a fragipan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a fragipan; the available water capacity in the upper 40 inches; and the content of calcium carbonate materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Table 19, parts I and II, show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a fragipan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a fragipan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a fragipan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and fragipans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a fragipan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the

soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a fragipan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, and soil reaction. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a fragipan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured fragipan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a fragipan, reaction, and content of lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a fragipan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Table 20 shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of this table, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a

fragipan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a fragipan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a fragipan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a fragipan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Water Management

Table 21, parts I and II, give information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; aquifer-fed excavated ponds; grassed waterways; terraces and diversions; and drainage. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low

Figure 19.—A pond constructed for a sediment basin. The trees are in an area of Miamian silt loam, 12 to 18 percent slopes, eroded.

maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment (fig. 19). Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than

5 feet of suitable material and a high content of stones or boulders or organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer. Depth to bedrock and the content of large stones affect the ease of excavation.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or a fragipan affect the construction of grassed waterways. A hazard of water erosion, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or a fragipan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, a fragipan, or other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or a fragipan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone. Availability of drainage outlets is not considered in the ratings.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics. These results are at the School of Natural Resources, Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the State Office, Natural Resources Conservation Service, Columbus, Ohio.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 22 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter (fig. 20). "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(3)* and the system adopted by the American Association of State Highway and Transportation Officials *(2)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the

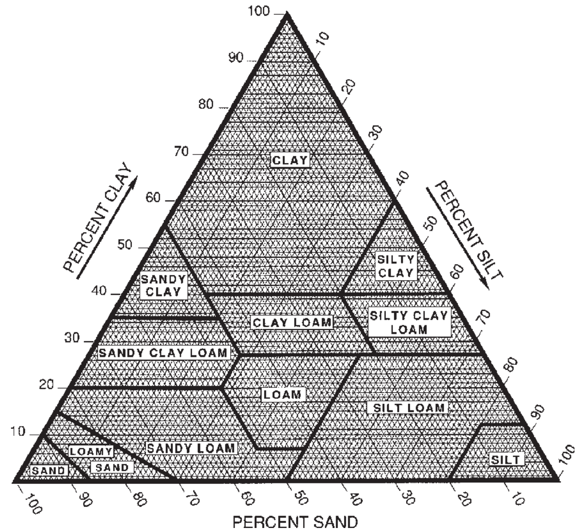


Figure 20.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

Physical Properties

Table 23 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002

millimeter in diameter. In table 23, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates in the table indicate the rate of water movement, in inches per hour (in/hr), when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are low, a change of 3 percent; moderate, 3 to 6 percent; high, 6 to 9 percent; and very high, more than 9 percent.

Erosion factors are shown in table 23 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of

soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Chemical Properties

Table 24 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 24, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer

than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Water Features

Table 25 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 25 indicates, by month, depth to the top *(upper limit)* and base *(lower limit)* of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Also indicated in the table is the *kind* of water table—that is, apparent or perched. An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 25 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is

nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 26 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness of the restrictive layer, which significantly affects the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution,

Figure 21.—Till fractures in Miami loam, 6 to 12 percent slopes, eroded.

acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical and Chemical Analyses of Selected Soils

Many of the soils in Preble County were sampled by the Soil Characterization Laboratory, School of Natural Resources, Ohio State University, Columbus, Ohio. The physical and chemical data obtained from the samples include particle size distribution, reaction, organic matter content, calcium carbonate content, and extractable cations.

These data were used in classifying and correlating soils and in evaluating their behavior under various land uses (fig. 21). Eleven pedons were selected as representative of the respective series and are described in the section “Soil Series and Their Morphology.” These series and their laboratory identification numbers are: Morningsun (PB-72), Celina (PB-73), Sugarvalley (PB-74), Celina (PB-75), Randolph (PB-76), Kokomo (PB-77), Sugarvalley (PB-78), Rainsville (PB-79), Morningsun (PB-80), Miamian (PB-81), and Miami (PB-82 and PB-83).

In addition to the data from Preble County, laboratory data are available from nearby or adjacent counties that have many of the same soils. These datasets and the data

from Preble County are on file at the School of Natural Resources, Ohio State University, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

Engineering Index Test Data

Engineering index test data are available for several pedons in Preble County. Additional engineering index test data is also available from several nearby counties that have many of the same soils as Preble County. These soils were analyzed for engineering properties by the Ohio Department of Transportation, Division of Highways, Bureau of Testing, Soils Foundation Section. The available test data are on file at the MLRA Project Office, Wilmington, Ohio; the Ohio State University, School of Natural Resources, Columbus, Ohio; the Ohio Department of Natural Resources, Division of Soil and Water Conservation, Columbus, Ohio; and the Natural Resources Conservation Service, State Office, Columbus, Ohio.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(31, 32)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 27 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in

the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” *(36)*. Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” *(31)* and in “Keys to Soil Taxonomy” *(32)*. Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Celina Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits and shoulders
Slope range: 0 to 6 percent
Adjacent soils: Crosby, Kokomo, Lewisburg, Losantville, and Miamian
Taxonomic class: Fine, mixed, active, mesic Aquic Hapludalfs

Typical Pedon

Celina silt loam, 2 to 6 percent slopes; about 5 miles north and 1 mile west of Eaton, in Washington Township, Preble County, Ohio; about 1,500 feet west and 300 feet north of the southeast corner of sec. 4, T. 8 N., R. 2 E.

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; common fine roots; 1 percent rock fragments; neutral; clear smooth boundary.

Ap2—4 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure; friable; common fine roots; 1 percent rock fragments; slightly acid; clear wavy boundary.

Bt1—9 to 16 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings along root channels; few faint brown (10YR 5/3) clay depletions on faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt2—16 to 22 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear smooth boundary.

Bt3—22 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in ped interiors; few fine distinct black (10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt4—28 to 32 inches; yellowish brown (10YR 5/4) loam; moderate fine and medium subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation on faces of peds; few fine distinct black

(10YR 2/1) manganese concretions in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

BC—32 to 38 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on vertical faces of peds; few distinct gray (10YR 6/1) carbonate coatings on faces of peds; common fine distinct light brownish gray (10YR 6/2) iron depletions along vertical faces of peds; common fine and medium prominent brownish yellow (10YR 6/8) masses of iron accumulation along vertical faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd1—38 to 50 inches; brown (10YR 5/3) loam; massive; firm; common medium faint grayish brown (10YR 5/2) iron depletions along vertical fractures; few fine prominent yellowish red (5YR 4/6) masses of iron accumulation along vertical fractures; few prominent white (10YR 8/1) calcium carbonate coatings along vertical fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2—50 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common medium faint grayish brown (10YR 5/2) iron depletions along vertical fractures; few fine and medium prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; few prominent light gray (10YR 7/1) calcium carbonate coatings along vertical fractures; 4 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 40 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: 0 to 2 percent in Ap horizon or in Bt horizon formed in loess; 1 to 10 percent in Bt or 2Bt horizon formed in till; 2 to 10 percent in BC or 2BC horizon; 3 to 10 percent in Cd or 2Cd horizon

Ap horizon:
Color—hue of 10YR, value of 4, and chroma of 2 or 3
Texture—silt loam or clay loam

Bt horizon formed in loess (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—silt loam or silty clay loam

Bt or 2Bt horizon formed in till:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam, silty clay loam, or loam

BC or 2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam or silt loam

Cd or 2Cd horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4
Texture—loam or silt loam

The Celina soils in Preble County are considered taxadjuncts to the Celina series because they have less clay in the particle-size control section than is defined in the range for the series. These soils classify as fine-loamy, mixed, active, mesic Aquic Hapludalfs. This difference, however, does not significantly affect use and management.

Corwin Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying till
Landform: Flats on the Wisconsinan till plains
Position on the landform: Summits
Slope range: 0 to 2 percent
Adjacent soils: Crosby, Kokomo, Celina, and Miamian
Taxonomic class: Fine-loamy, mixed, active, mesic Oxyaquic Argiudolls

Typical Pedon

Corwin silt loam, 0 to 2 percent slopes; about 2.5 miles east of Camden in Somers Township, Preble County, Ohio; about 1,200 feet south and 2,600 feet west of the northeast corner of sec. 12, T. 6 N., R. 2 E.

Ap—0 to 11 inches; very dark gray (10YR 3/1, unrubbed), very dark grayish brown (10YR 3/2, crushed), and dark brown (10YR 3/3, rubbed) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

Bt1—11 to 18 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine and medium roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt2—18 to 27 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bt3—27 to 33 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds and in root channels; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 3 percent rock fragments; neutral; clear wavy boundary.

BC—33 to 38 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 5 percent rock fragments and soft limestone; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd—38 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common fine faint grayish brown (10YR 5/2) iron depletions throughout; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout;

common fine distinct gray (10YR 6/1) masses of calcium carbonate accumulation throughout; 10 percent rock fragments and soft limestone; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Thickness of the mollic epipedon: 10 to 14 inches
Depth to carbonates: 20 to 35 inches
Thickness of the loess mantle: 0 to 14 inches
Content of rock fragments: 0 to 2 percent in Ap horizon; 1 to 10 percent in Bt horizon; 5 to 10 percent in BC horizon; 5 to 10 percent in Cd horizon

Ap horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—loam or clay loam

BC horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam, loam, or silt loam

Cd horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—loam or silt loam

Crosby Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: A thin layer of loess and the underlying till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits
Slope range: 0 to 4 percent
Adjacent soils: Celina, Kokomo, Lewisburg, Losantville, and Miamian
Taxonomic class: Fine, mixed, active, mesic Aeric Epiaqualfs

Typical Pedon

Crosby silt loam in an area of Crosby-Celina silt loams, 0 to 2 percent slopes; about 1 mile north of Verona, in Harrison Township, Preble County, Ohio; about 675 feet west and 1,120 feet south of the northeast corner of sec. 1, T. 7 N., R. 3 E.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; common fine roots; few faint very dark grayish brown (10YR 3/2) organic stains on faces of peds; few fine faint black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent rock fragments; slightly acid; abrupt smooth boundary.
Bt1—10 to 18 inches; yellowish brown (10YR 5/4) clay; moderate medium and coarse subangular blocky structure; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) and common medium distinct strong brown (7.5YR 5/6) masses

of iron accumulation in the matrix; common medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 2 percent rock fragments; slightly acid; clear smooth boundary.

Bt2—18 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark gray (10YR 4/1) and many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 2 percent rock fragments; neutral; clear irregular boundary.

BC—25 to 39 inches; yellowish brown (10YR 5/4) clay loam; weak thin and medium platy structure; firm; common fine roots; common prominent light gray (10YR 7/1) carbonate coatings on vertical faces of fractures; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual irregular boundary.

Cd—39 to 80 inches; yellowish brown (10YR 5/4) loam; massive; very firm; common prominent light gray (10YR 7/1) carbonate coatings on vertical faces of fractures; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 6 percent rock fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: 0 to 5 percent in Ap horizon or in Bt horizon formed in loess; 0 to 10 percent in Bt or 2Bt horizon formed in till; 2 to 8 percent in BC or 2BC horizon; 1 to 12 percent in Cd or 2Cd horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2
Texture—silt loam

Bt horizon formed in loess (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 6
Texture—silty clay loam

Bt or 2Bt horizon formed in till:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 6
Texture—silty clay loam, clay loam, silty clay, or clay

BC or 2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 6
Texture—loam or clay loam

Cd or 2Cd horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—loam

Cyclone Series

Depth class: Very deep
Drainage class: Poorly drained

Parent material: Loess and the underlying till
Landform: Flats and depressions on the Wisconsinan till plains
Slope range: 0 to 2 percent
Adjacent soils: Morningsun, Sugarvalley, Fincastle, Xenia, and Russell
Taxonomic class: Fine-silty, mixed, superactive, mesic Typic Argiaquolls

Typical Pedon

Cyclone silt loam, 0 to 2 percent slopes; about 9 miles west and 1.9 miles north of Eaton, in Jackson Township, Preble County, Ohio; about 219 feet east and 792 feet south of the northwest corner of sec. 30, T. 8 N., R. 1 E.

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine subangular blocky structure; friable; common fine and few medium roots; few fine faint black (10YR 2/1) manganese concretions throughout; neutral; abrupt smooth boundary.

Btg1—12 to 18 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine prominent red (2.5YR 4/6), few medium prominent yellowish red (5YR 4/6), and few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear smooth boundary.

Btg2—18 to 27 inches; gray (10YR 5/1) silty clay loam; moderate medium and coarse subangular blocky structure; firm; common fine roots; common distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent red (2.5YR 4/6) and common medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear wavy boundary.

Btg3—27 to 42 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate medium prismatic structure parting to strong coarse subangular blocky; firm; few fine roots; many distinct gray (10YR 5/1) clay films on faces of prisms; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation throughout; many medium prominent black (10YR 2/1) masses of manganese accumulation throughout; gray (10YR 5/1) organo-clay filled krotovinas along seams; neutral; clear wavy boundary.

Btg4—42 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct gray (10YR 5/1) clay films on faces of peds; many fine and medium prominent yellowish brown (10YR 5/6) and few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common medium prominent black (10YR 2/1) masses of manganese accumulation throughout; gray (10YR 5/1) organo-clay filled krotovinas along seams; neutral; clear wavy boundary.

2BC—50 to 61 inches; yellowish brown (10YR 5/6) loam; weak fine and medium subangular blocky structure; firm; few fine roots along faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions throughout; few medium faint yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; gray (10YR 5/1) organo-clay filled krotovinas along seams; 5 percent rock fragments; slightly effervescent; slightly alkaline; clear broken boundary.

2C—61 to 80 inches; yellowish brown (10YR 5/6) loam; massive; friable; few fine prominent grayish brown (10YR 5/2) iron depletions throughout; few medium distinct yellowish brown (10YR 5/8) masses of iron accumulation throughout; gray (10YR 5/1) organo-clay filled krotovinas along seams; 10 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 58 to 75 inches
Thickness of the mollic epipedon: 10 to 12 inches
Depth to carbonates: 43 to 60 inches
Thickness of the loess mantle: 40 to 60 inches
Content of rock fragments: 0 percent in Ap and Btg horizons; 1 percent in 2Bt horizon; 2 to 5 percent in 2BC horizon; 5 to 10 percent in 2C horizon

Ap horizon:
Color—hue of 10YR, value of 3, and chroma of 1 or 2
Texture—silt loam

Btg or Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 4
Texture—silty clay loam

2Bt horizon (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—clay loam

2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam or loam

2C horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 4 to 6
Texture—loam

Dana Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loess and the underlying till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits
Slope range: 0 to 6 percent
Adjacent soils: Cyclone, Fincastle, Russell, Wynn, and Xenia
Taxonomic class: Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls

Typical Pedon

Dana silt loam, 2 to 6 percent slopes; about 1 mile southeast of Morning Sun, in Israel Township, Preble County, Ohio; about 1,800 feet west and 135 feet north of the southeast corner of sec. 26, T. 6 N., R. 1 E.

Ap1—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common very fine to medium roots; slightly acid; clear smooth boundary.
Ap2—5 to 10 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate medium and coarse subangular blocky structure; friable; common very fine and fine roots; neutral; abrupt smooth boundary.
Bt1—10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine prismatic structure parting to strong medium and coarse subangular blocky; firm; common very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; neutral; clear smooth boundary.

Bt2—15 to 25 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings along root channels; few faint brown (10YR 5/3) clay depletions on faces of peds; few fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; neutral; clear wavy boundary.

Bt3—25 to 37 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; few very fine and fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark gray (10YR 3/1) organic coatings along root channels; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) and few fine prominent brownish yellow (10YR 6/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; neutral; clear wavy boundary.

2BC—37 to 48 inches; dark yellowish brown (10YR 4/4) clay loam; weak fine and medium subangular blocky structure; friable; few very fine and fine roots; few distinct brown (10YR 4/3) clay films along root channels; few distinct very dark gray (10YR 3/1) organic coatings along root channels; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine and medium prominent yellowish red (5YR 4/6) iron nodules in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; common fine and medium prominent white (10YR 8/1) masses of calcium carbonate accumulation in the matrix; 4 percent limestone and 3 percent shale fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C—48 to 65 inches; brown (10YR 5/3) loam that has pockets of yellowish brown (10YR 5/4) silt loam; massive; friable; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; common fine and medium distinct white (10YR 8/1) masses of calcium carbonate accumulation in the matrix; 3 percent limestone fragments, 2 percent igneous fragments, and 2 percent shale fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

2Cd—65 to 80 inches; brown (10YR 5/3) loam; massive; firm; few fine and medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent limestone fragments, 2 percent igneous fragments, and 2 percent shale fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the loess mantle: 22 to 40 inches
Depth to carbonates: 30 to 60 inches
Content of rock fragments: 0 percent in Ap and Bt horizons; 2 to 8 percent in 2BC horizon; 5 to 10 percent in 2C and 2Cd horizons

Ap horizon:
Color—hue of 10YR, value of 3, and chroma of 1 or 2
Texture—silt loam

Bt horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—silty clay loam

2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam or loam

2C and 2Cd horizons:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—loam; the upper part of horizon has pockets of silt loam in some pedons

Eel Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Recent alluvium
Landform: Flood plains
Slope range: 0 to 1 percent
Adjacent soils: Medway and Sloan
Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts

Typical Pedon

Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded; about 1/2 mile north of College Corner, in Israel Township, Preble County, Ohio; about 2,300 feet south and 435 feet east of the northwest corner of sec. 29, T. 6 N., R. 1 E.

Ap—0 to 13 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium and coarse granular structure parting to weak fine subangular blocky; friable; common fine and medium roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 1 percent rock fragments; neutral; clear smooth boundary.

Bw1—13 to 18 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 1 percent rock fragments; neutral; clear wavy boundary.

Bw2—18 to 23 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few fine roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent rock fragments; neutral; clear wavy boundary.

Bw3—23 to 31 inches; yellowish brown (10YR 5/4) loam; weak medium and coarse subangular blocky structure; friable; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent rock fragments; neutral; clear wavy boundary.

Bw4—31 to 37 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent rock fragments; neutral; clear wavy boundary.

BCg—37 to 48 inches; grayish brown (10YR 5/2) loam that has thin strata of very fine sandy loam; weak fine and medium subangular blocky structure; friable; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium

prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly effervescent; slightly alkaline; abrupt wavy boundary.

2C—48 to 80 inches; yellowish brown (10YR 5/4) gravelly sandy loam; massive; friable; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 20 percent rock fragments; slightly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the cambic horizon: 20 to 40 inches
Depth to carbonates: 20 to 40 inches
Content of rock fragments: 0 to 2 percent in Ap horizon; 0 to 5 percent in Bw horizon; 0 to 7 percent in BCg horizon; 15 to 25 percent in 2C horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam

Bw or Bg horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 to 6
Texture—silt loam, clay loam, or loam

BC or BCg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1 to 6
Texture—silt loam, loam, fine sandy loam, or sandy loam; thin strata of very fine sandy loam, clay loam, or silty clay loam occur in some pedons

2C or 2Cg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 1 to 4
Texture—gravelly analogues of loam, fine sandy loam, or sandy loam; strata of silt loam, silty clay loam, clay loam, loamy sand, or sand occur in some pedons

Eldean Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Outwash
Landform: Wisconsinan outwash terraces and kames
Position on the landform: Treads, risers, shoulders, and backslopes
Slope range: 0 to 18 percent
Adjacent soils: Lippincott, Savona, Ockley, Westland, and Kendallville
Taxonomic class: Fine, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Eldean loam, 0 to 2 percent slopes; 5.3 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 2,290 feet east and 265 feet south of the northwest corner of sec. 4, T. 9 N., R. 1 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loam; weak fine and medium subangular blocky structure; friable; common fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent gravel; neutral; abrupt smooth boundary.

BA—9 to 14 inches; brown (7.5YR 4/3) loam; weak medium subangular blocky structure; friable; few fine roots; few distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 2 percent gravel; neutral; abrupt wavy boundary.

Bt1—14 to 20 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint brown (7.5YR 4/3) clay films on faces of peds; 5 percent gravel; neutral; clear wavy boundary.

Bt2—20 to 28 inches; brown (7.5YR 4/4) gravelly clay; strong medium and coarse subangular blocky structure; firm; many faint brown (7.5YR 4/4) clay films on faces of peds; 15 percent gravel; neutral; gradual wavy boundary.

BC1—28 to 32 inches; dark reddish brown (5YR 3/2) gravelly clay loam; strong medium and coarse subangular blocky structure; firm; many faint dark brown (7.5YR 3/2) clay films on faces of peds; 15 percent gravel; neutral; gradual wavy boundary.

BC2—32 to 36 inches; very dark grayish brown (10YR 3/2) very gravelly coarse sandy loam; weak coarse subangular blocky structure; firm; few distinct dark brown (10YR 3/3) clay films on faces of peds; common medium prominent light gray (10YR 7/2) masses of calcium carbonate accumulation throughout; 35 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

C1—36 to 41 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 40 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

C2—41 to 46 inches; dark yellowish brown (10YR 4/6) loamy sand; single grain; loose; 10 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

C3—46 to 80 inches; dark yellowish brown (10YR 4/4) extremely gravelly loamy coarse sand; single grain; loose; 70 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 20 to 40 inches

Depth to carbonates: 18 to 36 inches

Content of rock fragments: 0 to 30 percent in Ap horizon and the upper part of Bt horizon; 10 to 59 percent in the lower part of Bt horizon and in BC horizon; 0 to 70 percent, with an average of more than 30 percent, in C horizon

Ap horizon:

Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4

Texture—dominantly silt loam, loam, or gravelly loam; gravelly clay loam in severely eroded pedons

BA horizon (if it occurs):

Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4

Texture—silt loam, loam, clay loam, or silty clay loam or their gravelly analogues

Bt horizon:

Color—hue of 5YR to 10YR and value and chroma of 3 to 6

Texture—clay or clay loam; the gravelly or very gravelly analogues of clay or clay loam may occur in the lower part of horizon

BC horizon:

Color—hue of 5YR to 10YR, value of 3 to 6, and chroma of 2 to 4

Texture—coarse sandy loam, sandy loam, loam, clay loam, or sandy clay loam or their gravelly or very gravelly analogues; in some pedons, tongues of the Bt and/or BC horizon may extend 2 to 3 feet into the C horizon

C horizon:

Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 6

Texture—stratified gravelly to extremely gravelly analogues of coarse sandy loam, loamy sand, or loamy coarse sand; strata of sand or loamy sand occur in some pedons

Fincastle Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Typically, loess and the underlying till; in the bedrock substratum phase, loess and the underlying till over limestone and shale
Landform: Flats on the Wisconsinan till plains and ground moraines
Position on the landform: Summits
Slope range: 0 to 2 percent
Adjacent soils: Cyclone, Xenia, Morningsun, Sugarvalley, and Russell
Taxonomic class: Fine-silty, mixed, superactive, mesic Aeric Epiaqualfs

Typical Pedon

Fincastle silt loam, 0 to 2 percent slopes; about 1.8 miles northwest of Morning Sun, in Israel Township, Preble County, Ohio; about 380 feet west and 93 feet north of the center of SE 1/4 of the NW 1/4 of sec. 21, T. 6 N., R. 1 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many fine roots; common medium prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; abrupt smooth boundary.

Btg—9 to 13 inches; grayish brown (10YR 5/2) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; many medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine and medium distinct black (10YR 2/1) iron and manganese concretions throughout; moderately acid; clear smooth boundary.

Bt1—13 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; slightly acid; clear smooth boundary.

Bt2—27 to 35 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; slightly acid; clear smooth boundary.

2Bt3—35 to 38 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; 5 percent subrounded granite fragments; neutral; clear wavy boundary.

2BC—38 to 46 inches; brown (10YR 5/3) clay loam; weak coarse subangular blocky

structure; firm; common faint grayish brown (10YR 5/2) clay films on vertical faces of peds; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; 5 percent subrounded granite fragments and 5 percent subrounded limestone fragments; slightly effervescent; slightly alkaline; clear smooth boundary.

2Cd—46 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; 5 percent subrounded granite fragments and 5 percent subrounded limestone fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to bedrock: Typically more than 80 inches; in the bedrock substratum phase, ranging from 60 to 80 inches
Thickness of the loess mantle: 22 to 40 inches
Content of rock fragments: 0 to 1 percent in Ap and Bt horizons; 1 to 7 percent in 2Bt horizon; 1 to 10 percent in 2BC horizon; 2 to 14 percent in 2Cd horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam

Bt or Btg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 6
Texture—silt loam or silty clay loam

2Bt or 2Btg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 6
Texture—clay loam, silty clay loam, or loam

2BC or 2BCg horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 6
Texture—clay loam or loam

2Cd horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—loam; in the bedrock substratum phase, ranging to loam or flaggy loam

3Cr horizon (in the bedrock substratum phase):
Bedrock—weathered shale and limestone

Fox Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loamy material over gravelly and very gravelly sandy outwash over till
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope range: 0 to 6 percent
Adjacent soils: Ockley
Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Fox silt loam, till substratum, 0 to 2 percent slopes; about 1.75 miles north of West Alexandria, in Twin Township, Preble County, Ohio; 1,900 feet east and 1,060 feet south of the northwest corner of sec. 27, T. 6 N., R. 3 E.

Ap1—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine and medium roots; 1 percent gravel; neutral; clear smooth boundary.

Ap2—6 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; many fine and medium roots; 1 percent gravel; slightly acid; abrupt smooth boundary.

Bt1—10 to 15 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; few distinct brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 5/3) clay depletions on faces of peds; 1 percent gravel; neutral; clear smooth boundary.

Bt2—15 to 20 inches; brown (7.5YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; 8 percent gravel; neutral; clear smooth boundary.

Bt3—20 to 26 inches; brown (7.5YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine roots; many distinct brown (7.5YR 4/3) clay films on faces of peds; 9 percent gravel; neutral; clear smooth boundary.

Bt4—26 to 31 inches; brown (7.5YR 4/3) clay loam; moderate fine prismatic structure parting to moderate medium and coarse subangular blocky; firm; common fine roots; many distinct dark brown (7.5YR 3/3) clay films on faces of peds; few fine prominent brownish yellow (10YR 6/8) masses of iron accumulation throughout; 12 percent gravel; neutral; clear wavy boundary.

Bt5—31 to 37 inches; brown (10YR 4/3) gravelly sandy clay loam; weak fine and medium subangular blocky structure; firm; common fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; many fine and medium prominent white (10YR 8/1) masses of calcium carbonate accumulation throughout; 20 percent gravel; neutral; gradual wavy boundary.

C1—37 to 46 inches; yellowish brown (10YR 5/4) very gravelly loamy sand; single grain; loose; few fine roots; 45 percent gravel; slightly effervescent; slightly alkaline; gradual wavy boundary.

C2—46 to 64 inches; brown (10YR 5/3) extremely gravelly loamy sand; single grain; loose; 65 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2C—64 to 80 inches; brown (10YR 5/3) loam; massive; friable; 5 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 25 to 40 inches
Depth to carbonates: 20 to 40 inches
Depth to till: 60 to 80 inches
Content of rock fragments: 1 to 4 percent in Ap horizon; 1 to 20 percent in Bt horizon; 15 to 65 percent in C horizon; 2 to 10 percent in 2C horizon

Ap horizon:
Color—hue of 10YR, value of 3 or 4, and chroma of 2 or 3
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam, loam, gravelly clay loam, or gravelly sandy clay loam

BC horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4
Texture—gravelly loam or very gravelly sandy loam

C horizon:
Color—hue of 10YR, value of 5, and chroma of 3 or 4
Texture—gravelly loamy sand, very gravelly loamy sand, extremely gravelly loamy sand, or very gravelly sand

2C horizon:
Color—hue of 10YR, value of 5, and chroma of 3
Texture—loam

The Fox soils in map unit FmB2 are considered taxadjuncts to the Fox series because they do not have a strongly contrasting particle-size class, which is defined in the ranges for the series. These soils classify as fine-loamy, mixed, superactive, mesic Typic Hapludalfs. This difference, however, does not significantly affect use and management.

Hennepin Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Basal till
Landform: Wisconsinan till plains
Position on the landform: Backslopes
Slope range: 18 to 50 percent
Adjacent soils: Miamian and Wynn
Taxonomic class: Fine-loamy, mixed, active, mesic Typic Eutrudepts

Typical Pedon

Hennepin silt loam in an area of Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded; about 2.25 miles northeast of College Corner, in Israel Township, Preble County, Ohio; about 1,150 feet east and 1,975 feet south of the northwest corner of sec. 28, T. 6 N., R. 1 E.

A—0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium subangular blocky structure; friable; many fine, common medium, and few coarse roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent rock fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

Bw—4 to 16 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cd—16 to 80 inches; brown (10YR 5/3) loam; massive; very firm; few fine roots along vertical faces of fractures in the upper part; common distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation along vertical fractures; 10 percent rock fragments; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 10 to 20 inches
Carbonates: Common throughout the profile
Content of rock fragments: 2 to 5 percent in A horizon; 2 to 10 percent in Bw horizon; 5 to 12 percent in Cd horizon

A horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—silt loam or clay loam

Bw horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 4
Texture—loam or clay loam

Cd horizon:
Color—hue of 10YR, value of 5, and chroma of 3 or 4
Texture—loam

The Hennepin soils in Preble County are considered taxadjuncts to the Hennepin series because they have a dense till substratum (Cd horizon), which is not defined in the ranges for the series. These soils classify as loamy, mixed, active, mesic, shallow Typic Eutrudepts. This difference, however, does not significantly affect use and management.

Kendallville Series

Depth class: Very deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying outwash and till
Landform: Kames, moraines, and outwash terraces
Position on the landform: Shoulders, footslopes, backslopes, and risers
Slope range: 6 to 50 percent
Adjacent soils: Miamian and Rainsville
Taxonomic class: Fine-loamy, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Kendallville silt loam in an area of Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded; about 2 miles northeast of New Paris, in Jefferson Township, Preble County, Ohio; about 1,484 feet south and 1,286 feet east of the northwest corner of sec. 16, T. 9 N., R. 1 E.

Ap—0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; many fine roots; many distinct very dark grayish brown (10YR 3/2) organic coatings throughout; 2 percent gravel; neutral; clear smooth boundary.
Bt1—4 to 9 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; common prominent very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; 10 percent gravel; moderately acid; clear smooth boundary.
Bt2—9 to 16 inches; brown (7.5YR 5/4) clay loam; moderate medium and coarse subangular blocky structure; firm; few fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; very few prominent very dark grayish brown (10YR 3/2) organic coatings on vertical faces of peds; 5 percent gravel; slightly acid; clear wavy boundary.

Bt3—16 to 21 inches; yellowish brown (10YR 5/4) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 3 percent gravel; neutral; clear wavy boundary.

Bt4—21 to 29 inches; brown (7.5YR 4/4) gravelly clay loam; weak coarse subangular blocky structure; firm; common distinct dark brown (10YR 3/3) clay films on vertical faces of peds; common prominent light gray (10YR 7/2) masses of calcium carbonate accumulation around gravel; 30 percent gravel; neutral; abrupt smooth boundary.

2Cd1—29 to 41 inches; yellowish brown (10YR 5/4) loam; massive with horizontal fractures; firm; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation throughout; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent subrounded and angular rock fragments; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2Cd2—41 to 80 inches; yellowish brown (10YR 5/4) loam; massive; firm; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation throughout; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine faint pale brown (10YR 6/3) masses of calcium carbonate accumulation along vertical fractures; 10 percent subrounded and angular rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum and depth to till: Commonly 25 to 40 inches; ranging to 55 inches in some areas

Depth to carbonates: 20 to 40 inches

Thickness of the loess mantle: 0 to 10 inches

Content of rock fragments: 0 to 2 percent in Ap horizon; 2 to 30 percent in Bt horizon; 5 to 14 percent in 2Cd horizon

Ap horizon:

Color—hue of 10YR, value of 4, and chroma of 2 or 3

Texture—silt loam or loam

Bt or 2Bt horizon:

Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4

Texture—silty clay loam in the upper part of horizon (if a loess cap is present), clay loam, or gravelly clay loam

2Cd or 3Cd horizon:

Color—hue of 10YR, value of 5, and chroma of 3 or 4

Texture—loam

Kokomo Series

Depth class: Very deep

Drainage class: Very poorly drained

Parent material: Loamy material and the underlying till

Landform: Flats and depressions on the Wisconsinan till plains

Slope range: 0 to 1 percent

Adjacent soils: Celina, Crosby, and Miamian

Taxonomic class: Fine, mixed, superactive, mesic Typic Argiaquolls (fig. 22)

Typical Pedon

Kokomo silty clay loam, 0 to 1 percent slopes; about 3.2 miles northeast of Eaton, in Twin Township, Preble County, Ohio; about 480 feet north and 900 feet east of the southwest corner of sec. 18, T. 6 N., R. 3 E.

Figure 22.—Profile of a Kokomo soil.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium and coarse angular blocky structure; firm; many very fine to medium roots; few fine faint black (10YR 2/1) manganese concretions throughout; 1 percent limestone and igneous fragments; strongly acid; abrupt smooth boundary.

A—8 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak medium and coarse angular blocky structure; firm; many fine and very fine roots; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; 1 percent limestone and igneous fragments; strongly acid; clear smooth boundary.

Btg1—11 to 15 inches; dark gray (10YR 4/1) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium prominent dark yellowish brown (10YR 4/6) and few medium prominent yellowish red (5YR 4/6) masses of iron accumulation throughout; 1 percent limestone and igneous fragments; slightly acid; clear wavy boundary.

Btg2—15 to 21 inches; dark grayish brown (10YR 4/2) clay loam; weak medium prismatic structure parting to moderate medium subangular blocky; firm; common fine and very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few medium prominent dark yellowish brown (10YR 4/6) and common fine and medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation throughout; 1 percent igneous fragments; slightly acid; gradual wavy boundary.

Btg3—21 to 27 inches; grayish brown (2.5Y 5/2) clay loam; moderate fine and medium subangular blocky structure; firm; few fine and medium roots; common distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few medium prominent dark yellowish brown (10YR 4/6) and common fine and medium distinct and prominent light olive brown (2.5Y 5/4 and 5/6) masses of iron accumulation throughout; 1 percent igneous fragments; neutral; gradual wavy boundary.

Btg4—27 to 33 inches; grayish brown (2.5Y 5/2) clay loam; moderate medium

subangular blocky structure; firm; few fine and medium roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium and coarse prominent dark yellowish brown (10YR 4/6) and common fine distinct and prominent light olive brown (2.5Y 5/4 and 5/6) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent igneous fragments; neutral; gradual wavy boundary.

Btg5—33 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine and very fine roots; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common coarse prominent dark yellowish brown (10YR 4/6) and common medium prominent light olive brown (2.5Y 5/6) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent igneous fragments; neutral; gradual wavy boundary.

Bt—41 to 48 inches; light olive brown (2.5Y 5/3) clay loam; moderate fine and medium subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; many medium and coarse faint grayish brown (10YR 5/2) iron depletions in the matrix; many medium and coarse prominent dark yellowish brown (10YR 4/6) and common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent igneous fragments; slightly alkaline; gradual wavy boundary.

2BC—48 to 64 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium subangular blocky structure; firm; few distinct dark grayish brown (10YR 4/2) clay films along root channels; many medium and coarse distinct grayish brown (10YR 5/2) iron depletions in the matrix; common medium and coarse distinct dark yellowish brown (10YR 4/6) and common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 7 percent igneous, limestone, and shale fragments; slightly effervescent; slightly alkaline; gradual wavy boundary.

2C—64 to 80 inches; dark yellowish brown (10YR 4/4) loam; massive; firm; few coarse prominent brownish yellow (10YR 6/8) masses of iron accumulation along vertical fractures; common medium distinct gray (10YR 6/1) masses of secondary carbonates along faces of fractures; 8 percent igneous, limestone, and shale fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 50 to 70 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to carbonates: 36 to 60 inches
Content of rock fragments: 0 to 5 percent in Ap and Btg horizons; 1 to 10 percent in 2Bt, 2BC, and 2C horizons

Ap or A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 or 2
Texture—silty clay loam or silt loam

Btg horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2
Texture—silty clay loam, silty clay, or clay loam

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4
Texture—silty clay loam, silty clay, or clay loam

2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam or loam

2C horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—loam

Lewisburg Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Basal till
Landform: Flats and slight rises on the Wisconsinan till plains
Position on the landform: Summits and shoulders
Slope range: 0 to 12 percent
Adjacent soils: Celina, Crosby, Kokomo, Losantville, and Miamian
Taxonomic class: Clayey, mixed, active, mesic, shallow Aquic Hapludalfs

Typical Pedon

Lewisburg silt loam, 2 to 6 percent slopes; about 3.5 miles south of New Madison, in Butler Township, Darke County, Ohio; 60 feet north and 2,640 feet west of the southeast corner of sec. 31, T. 10 N., R. 2 E.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; weak fine and medium subangular blocky structure parting to moderate medium granular; friable; few fine roots; 2 percent rock fragments; neutral; clear smooth boundary.

Bt—9 to 14 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine faint dark yellowish brown (10YR 4/4) masses of iron and manganese accumulation in the matrix; 5 percent rock fragments; slightly alkaline; clear wavy boundary.

BC—14 to 19 inches; dark yellowish brown (10YR 4/6) loam; weak medium subangular blocky structure; firm; few fine roots; few faint dark grayish brown (10YR 4/2) clay films on vertical faces of peds; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; few fine prominent black (10YR 2/1) manganese concretions throughout; 12 percent rock fragments; slightly effervescent; moderately alkaline; clear wavy boundary.

Cd1—19 to 30 inches; yellowish brown (10YR 5/4) loam; massive; firm; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct very dark gray (10YR 3/1) iron and manganese concretions throughout; common distinct light gray (10YR 7/2) calcium carbonate coatings on vertical fracture faces; 12 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2—30 to 80 inches; yellowish brown (10YR 5/4) loam; massive; very firm; common fine distinct grayish brown (10YR 5/2) iron depletions along fracture faces; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation along fracture faces; few distinct light gray (10YR 7/2) calcium carbonate coatings on vertical fracture faces 4 inches apart; 12 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 10 to 20 inches
Depth to carbonates: 8 to 16 inches
Rock fragments (content, kind): 0 to 10 percent in Ap horizon, 2 to 12 percent in Bt and BC horizons, and 2 to 14 percent in Cd horizon; rock fragments are of mixed lithology, including some crystalline rocks

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—silt loam or clay loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay, silty clay, clay loam, or silty clay loam

BC horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam, silty clay loam, loam, or silt loam

Cd horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6
Texture—loam or silt loam

Lippincott Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Silty material and the underlying outwash having a high content of limestone gravel and sand
Landform: Depressions on the Wisconsinan outwash terraces
Position on the landform: Treads
Slope range: 0 to 2 percent
Adjacent soils: Eldean and Savona
Taxonomic class: Fine, mixed, superactive, mesic Typic Argiaquolls (fig. 23)

Typical Pedon

Lippincott silty clay loam, 0 to 2 percent slopes; about 5.3 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 1,410 feet east and 480 feet south of the northwest corner of sec. 4, T. 9 N., R. 1 E.

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure; friable; common fine roots; 2 percent gravel; neutral; abrupt smooth boundary.
Btg1—11 to 18 inches; dark gray (10YR 4/1) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds and in root channels; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) and common fine prominent light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; few fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; clear wavy boundary.
Btg2—18 to 25 inches; grayish brown (2.5Y 5/2) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds and in root channels; few fine faint light

Figure 23.—Profile of a Lippincott soil. The scale is in 6-inch increments.

brownish gray (2.5Y 6/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/6) and common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; few fine and medium prominent black (10YR 2/1) masses of manganese accumulation throughout; common prominent white (10YR 8/1) masses of calcium carbonate accumulation around pebbles; 10 percent gravel; slightly effervescent around weathered rock fragments; slightly alkaline; clear wavy boundary.

BCg1—25 to 30 inches; dark gray (10YR 4/1) gravelly clay loam; weak coarse subangular blocky structure; firm; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; few fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; common prominent white (10YR 8/1) masses of calcium carbonate accumulation throughout; 30 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.

BCg2—30 to 36 inches; dark gray (10YR 4/1) gravelly coarse sandy loam; weak coarse subangular blocky structure; firm; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; few fine and medium faint black (10YR 2/1) masses of manganese accumulation throughout; common prominent white (10YR 8/1)

masses of calcium carbonate accumulation throughout; 30 percent gravel; slightly effervescent; slightly alkaline; clear smooth boundary.
2Cg—36 to 80 inches; gray (10YR 5/1) extremely gravelly loamy coarse sand; single grain; loose; 65 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 25 to 40 inches
Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 25 to 60 inches
Content of rock fragments: 0 to 10 percent in Ap horizon; 0 to 14 percent in Btg horizon; 15 to 59 percent in BCg horizon; 35 to 70 percent in 2Cg horizon

Ap horizon:
Color—horizon has hue of 10YR or is neutral in hue, has value of 2, 2.5, or 3, and has chroma of 0 to 2
Texture—silty clay loam

Btg horizon:
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 4 or 5, and has chroma of 0 to 2
Texture—clay loam, silty clay loam, silty clay, or clay

BCg horizon:
Color—horizon has hue of 10YR or 2.5Y or is neutral in hue, has value of 4 to 6, and has chroma of 0 to 2
Texture—gravelly or very gravelly analogues of clay loam, loam, silt loam, sandy loam, or coarse sandy loam

2Cg horizon:
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 4 to 6, and has chroma of 0 to 2
Texture—very gravelly or extremely gravelly analogues of coarse sandy loam, sandy loam, loam, sand, loamy sand, or loamy coarse sand; horizon commonly is stratified

Losantville Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Basal till
Landform: Wisconsinan till plains
Position on the landform: Backslopes and shoulders
Slope range: 6 to 18 percent
Adjacent soils: Hennepin and Miamian
Taxonomic class: Clayey, mixed, active, mesic, shallow Oxyaquic Hapludalfs

Typical Pedon

Losantville clay loam in an area of Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded; about 1.25 miles east of New Paris, in Jefferson Township, Preble County, Ohio; about 1,300 feet west and 1,130 feet south of the northeast corner of sec. 28, T. 9 N., R. 1 E.

Ap—0 to 3 inches; brown (10YR 4/3) clay loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; firm; common fine roots; 2 percent rock fragments; neutral; abrupt smooth boundary.
Bt1—3 to 7 inches; dark yellowish brown (10YR 4/4) clay loam; moderate fine and

medium subangular blocky structure; firm; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 4 percent rock fragments; neutral; clear smooth boundary.

Bt2—7 to 14 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; neutral; clear smooth boundary.

BC—14 to 19 inches; yellowish brown (10YR 5/4) clay loam; massive parting to weak fine and medium subangular blocky structure; firm; common fine roots; common distinct dark brown (10YR 3/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; slightly effervescent; moderately alkaline; gradual wavy boundary.

Cd1—19 to 29 inches; brown (10YR 5/3) loam; massive; firm; few fine roots; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation throughout; 2 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd2—29 to 80 inches; brown (10YR 5/3) loam; massive; very firm; common fine faint light brownish gray (10YR 6/2) iron depletions along vertical fractures; few fine prominent yellowish red (5YR 5/6) masses of iron accumulation along vertical fractures; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; 8 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 12 to 20 inches
Depth to carbonates: 11 to 15 inches
Depth to dense till: 12 to 20 inches
Content of rock fragments: 0 to 3 percent in Ap horizon; 1 to 10 percent in Bt horizon; 3 to 10 percent in BC horizon; 5 to 10 percent in Cd horizon

Ap horizon:
Color—hue of 10YR, value of 4, and chroma of 2 to 4
Texture—clay loam

Bt horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 4
Texture—clay loam

BC horizon:
Color—hue of 10YR, value of 5, and chroma of 3 or 4
Texture—clay loam or loam

Cd horizon:
Color—hue of 10YR, value of 5, and chroma of 3
Texture—loam

Mahalasville Series

Depth class: Very deep
Drainage class: Very poorly drained

Parent material: Loess or other silty material and the underlying loamy and sandy outwash
Landform: Depressions on lake plains
Slope range: 0 to 2 percent
Adjacent soils: Eldean, Lippincott, Milford, and Savona
Taxonomic class: Fine-silty, mixed, superactive, mesic Typic Argiaquolls

Typical Pedon

Mahalasville silty clay loam, 0 to 1 percent slopes; about 2 miles northwest of Summitville, in Madison County, Indiana; about 2,000 feet west and 325 feet south of the northeast corner of sec. 7, T. 22 N., R. 8 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.
A—7 to 12 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; moderate fine and medium subangular blocky structure; firm; neutral; gradual wavy boundary.
Btg1—12 to 18 inches; gray (5Y 5/1) silty clay loam; moderate fine angular blocky structure; firm; faint very dark brown (10YR 2/2) clay films on faces of peds; common fine prominent reddish brown (5YR 5/4) masses of iron accumulation in the matrix; neutral; gradual wavy boundary.
Btg2—18 to 39 inches; gray (5Y 5/1) silty clay loam; weak medium prismatic structure parting to moderate medium angular blocky; firm; faint and distinct dark gray (10YR 4/1) clay films on faces of peds; common medium prominent brown (7.5YR 4/4) masses of iron accumulation in the matrix; neutral; clear wavy boundary.
2BCg—39 to 44 inches; gray (N 6/0) loam; weak coarse subangular blocky structure; friable; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; about 1 percent rock fragments; slightly alkaline; abrupt wavy boundary.
2Cg—44 to 60 inches; gray (N 6/0) stratified silt loam and sand; massive; friable; common coarse prominent yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) masses of iron accumulation in the matrix; about 10 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the loess or other silty material: 24 to 40 inches
Thickness of the mollic epipedon: 10 to 21 inches
Thickness of the solum: 40 to 60 inches
Content of rock fragments: 0 percent in Ap and Btg horizons; 0 to 5 percent in 2Btg or 2BCg horizon; 0 to 10 percent in 2Cg horizon

Ap or A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 or 2
Texture—silt loam

Btg horizon:
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 4 to 6, and has chroma of 0 to 2
Texture—silty clay loam or silt loam

2Btg horizon (if it occurs):
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 4 to 6, and has chroma of 0 to 2
Texture—silty clay loam, clay loam, loam, or silt loam

2BCg horizon:

Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 4 to 6, and has chroma of 0 to 2

Texture—loam, sandy loam, or silt loam

2Cg horizon:

Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 4 to 6, and has chroma of 0 to 2

Texture—stratified sand, sandy loam, silt loam, or loam; thin strata of the gravelly analogues of these textures may also occur

Medway Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loamy alluvium
Landform: Flood plains
Slope range: 0 to 1 percent
Adjacent soils: Eel and Sloan
Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls

Typical Pedon

Medway silt loam, 0 to 1 percent slopes, occasionally flooded; about 1.5 miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 2,500 feet north and 1,475 feet west of the southeast corner of sec. 17, T. 9 N., R. 1 E.

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; common fine and medium roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 1 percent rock fragments; neutral; abrupt smooth boundary.

Bw1—12 to 25 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine and medium roots; common distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 5 percent rock fragments; neutral; clear wavy boundary.

Bw2—25 to 38 inches; brown (10YR 5/3) loam; weak medium subangular blocky structure; friable; few fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; neutral; clear wavy boundary.

C1—38 to 45 inches; yellowish brown (10YR 5/4) clay loam; massive; friable; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

C2—45 to 53 inches; yellowish brown (10YR 5/4) clay loam; massive; friable; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments, mostly gravel; slightly effervescent; moderately alkaline; clear wavy boundary.

C3—53 to 80 inches; yellowish brown (10YR 5/4) gravelly loam; massive; friable; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 20 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 28 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 30 to 70 inches
Content of rock fragments: 0 to 14 percent in Ap and Bw horizons; 0 to 34 percent in C horizon

Ap horizon:
Color—hue of l0YR, value of 2 or 3, and chroma of 1 to 3
Texture—silt loam

Bw horizon:
Color—hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4
Texture—commonly silt loam or loam; individual horizons of clay loam, silty clay loam, sandy loam, fine sandy loam, or sandy clay loam occur less commonly

C horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 1 to 6
Texture—stratified loam, silt loam, silty clay loam, clay loam, or sandy loam or their gravelly analogues

The Medway soils in Preble County are considered taxadjuncts to the Medway series because they have redoximorphic features at a depth greater than that allowed in the range for the series. These soils classify as fine-loamy, mixed, superactive, mesic Fluventic Hapludolls. This difference, however, does not significantly affect use and management.

Miami Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying till or entirely till
Landform: Slight rises on the Wisconsinan till plains and on kames
Position on the landform: Backslopes and shoulders
Slope range: 2 to 50 percent
Adjacent soils: Celina, Celina, Crosby, Kokomo, and Kendallville
Taxonomic class: Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs

Typical Pedon

Miami loam, 6 to 12 percent slopes, eroded; about 3.2 miles northwest of New Paris, in Jefferson Township, Preble County, Ohio; about 2,100 feet north and 850 east of the southwest corner of sec. 7, T. 9 N., R. 1 E.

Ap—0 to 5 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; 10 percent mixing of yellowish brown (10YR 5/4) material from Bt horizon; weak fine and medium subangular blocky structure; friable; many fine and medium roots; common faint dark brown (10YR 3/3) organic coatings on faces of peds; 1 percent igneous fragments; slightly acid; abrupt wavy boundary.
Bt—5 to 20 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; common fine and medium roots; common

distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 2 percent limestone cobbles, 3 percent limestone fragments, and 2 percent igneous fragments; moderately acid; clear wavy boundary.

BC—20 to 26 inches; yellowish brown (10YR 5/4) loam; weak coarse subangular blocky structure; firm; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few medium distinct light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 2 percent limestone cobbles, 3 percent limestone fragments, and 5 percent igneous fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

Cd1—26 to 40 inches; brown (10YR 5/3) loam; massive; very firm; common fine faint grayish brown (10YR 5/2) and distinct gray (10YR 6/1) iron depletions in the matrix; common fine distinct and prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; few medium faint light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 10 percent igneous fragments and 2 percent igneous cobbles; strongly effervescent; moderately alkaline; clear wavy boundary.

Cd2—40 to 57 inches; brown (10YR 5/3) loam; massive; very firm; common fine distinct gray (10YR 6/1) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few medium faint light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 10 percent igneous fragments and 3 percent igneous cobbles; violently effervescent; moderately alkaline; clear wavy boundary.

Cd3—57 to 80 inches; brown (10YR 5/3) gravelly loam; massive; very firm; common fine distinct gray (10YR 6/1) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few medium faint light brownish gray (10YR 6/2) masses of secondary carbonates throughout; 15 to 20 percent igneous fragments and 3 percent igneous cobbles; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Depth to carbonates: 20 to 40 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: 0 to 5 percent in Ap horizon or in Bt horizon formed in loess; 2 to 10 percent in Bt or 2Bt horizon formed in till and in BC or 2BC horizon; 5 to 20 percent in Cd or 2Cd horizon

Ap horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 1 to 4
Texture—silt loam or loam

Bt or 2Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 6
Texture—silty clay loam in the upper part (if a loess cap is present) or clay loam

BC or 2BC horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 or 4
Texture—clay loam or loam

Cd or 2Cd horizon:
Color—hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 or 4
Texture—loam or gravelly loam

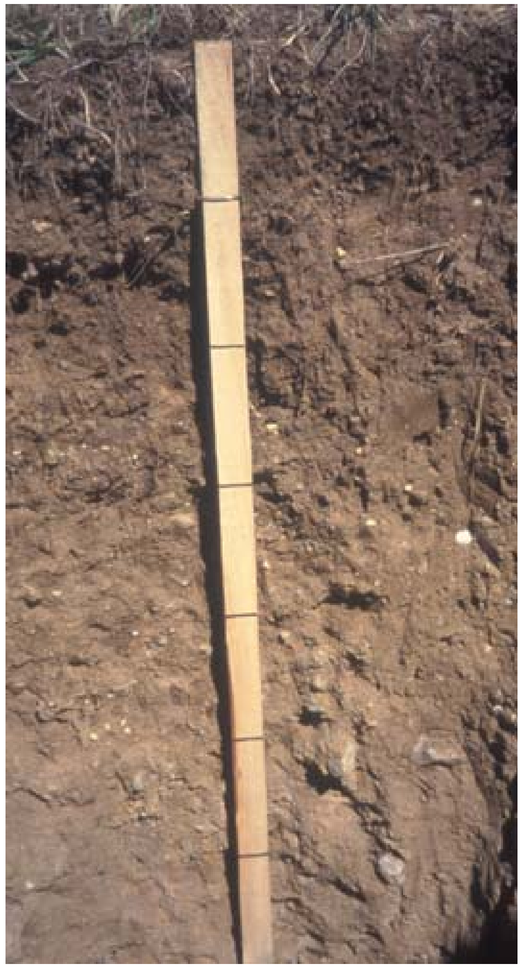


Figure 24.—Profile of a Miamian soil. The scale is in 6-inch increments.

Miamian Series

Depth class: Very deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying till or entirely till
Landform: Wisconsinan till plains
Position on the landform: Summits, shoulders, and backslopes
Slope range: 2 to 50 percent
Adjacent soils: Celina, Crosby, Losantville, Hennepin, Kendallville, and Kokomo
Taxonomic class: Fine, mixed, active, mesic Oxyaquic Hapludalfs (fig. 24)

Typical Pedon

Miamian silt loam, 6 to 12 percent slopes, eroded; about 0.5 mile southeast of Camden, in Somers Township, Preble County, Ohio; about 2,100 feet east and 1,200 feet south of the northwest corner of sec. 15, T. 6 N, R. 2 E.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine subangular blocky structure; friable; many fine roots throughout; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; few medium

prominent yellowish red (5YR 5/8) masses of iron accumulation throughout; 2 percent rock fragments; neutral; abrupt smooth boundary.

Bt1—6 to 12 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium and fine subangular blocky structure; firm; common fine roots throughout; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; few medium prominent yellowish red (5YR 5/8) masses of iron accumulation throughout; 5 percent rock fragments; neutral; clear wavy boundary.

Bt2—12 to 18 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common fine roots throughout; common distinct brown (10YR 4/3) clay films on faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; few medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; neutral; clear wavy boundary.

BC—18 to 29 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few fine roots along vertical faces of peds; few distinct brown (10YR 4/3) clay films on vertical faces of peds; few distinct dark brown (10YR 3/3) organic coatings on vertical faces of peds; common medium prominent reddish yellow (7.5YR 6/8) masses of iron accumulation throughout and around rock fragments; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; many medium distinct white (10YR 8/1) masses of calcium carbonate accumulation throughout and around rock fragments; 10 percent rock fragments; strongly effervescent; moderately alkaline; gradual wavy boundary.

Cd—29 to 80 inches; yellowish brown (10YR 5/4) loam; massive; very firm; few fine roots along vertical fractures; common medium distinct grayish brown (10YR 5/2) iron depletions along vertical fractures; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation around the iron depletions; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; few medium distinct black (10YR 2/1) masses of manganese accumulation throughout; many fine distinct grayish brown (10YR 5/2) masses of calcium carbonate accumulation along vertical fractures; 12 percent rock fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 30 inches
Thickness of the loess mantle: 0 to 15 inches
Content of rock fragments: 0 to 2 percent in Ap horizon or in Bt horizon formed in loess; 2 to 12 percent in Bt or 2Bt horizon formed in till and in BC or 2BC horizon; 5 to 15 percent in Cd or 2Cd horizon

Ap horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 or 3
Texture—silt loam or clay loam

Bt or 2Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—silty clay loam in the upper part (if a loess cap is present), clay loam, or clay

BC or 2BC horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam or loam

Cd or 2Cd horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4
Texture—loam or gravelly loam

Milford Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Lacustrine sediments or lacustrine sediments over gravelly and sandy outwash
Landform: Depressions on glacial lake plains
Slope range: 0 to 2 percent
Adjacent soils: Eldean, Lippincott, Mahalasville, and Savona
Taxonomic class: Fine, mixed, superactive, mesic Typic Endoaquolls

Typical Pedon

Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes; about 4.75 miles north-northwest of New Paris, in Jefferson Township, Preble County, Ohio; about 780 feet west and 300 feet south of the northeast corner of sec. 6, T. 9 N., R. 1 E.

Ap1—0 to 5 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium and coarse subangular blocky structure parting to weak fine subangular blocky; friable; many fine and medium roots; many fine pores; neutral; clear wavy boundary.

Ap2—5 to 11 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium and coarse subangular blocky structure; firm; many fine and medium roots; slightly acid; abrupt smooth boundary.

BA—11 to 17 inches; very dark gray (10YR 3/1) silty clay loam; moderate medium prismatic structure parting to moderate coarse angular blocky; firm; common fine and medium roots; common distinct black (10YR 2/1) organic coatings on faces of peds; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear smooth boundary.

Bg—17 to 24 inches; dark gray (10YR 4/1) silty clay; strong coarse prismatic structure parting to strong coarse angular blocky; very firm; common fine roots; common distinct black (10YR 2/1) organic coatings on faces of peds; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation along root channels; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; clear smooth boundary.

BCg1—24 to 33 inches; gray (2.5Y 6/1) silty clay; massive; firm; common fine roots; few distinct very dark gray (10YR 3/1) organic coatings along root channels; many medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation along root channels; slightly effervescent; slightly alkaline; clear wavy boundary.

BCg2—33 to 46 inches; gray (5Y 5/1) silty clay loam; massive; firm; few fine roots; few prominent very dark gray (10YR 3/1) organic coatings along root channels; many fine and medium prominent strong brown (7.5YR 5/6) masses of iron accumulation along root channels; slightly effervescent; slightly alkaline; gradual wavy boundary.

Cg—46 to 54 inches; olive gray (5Y 5/2) silt loam; massive; friable; common fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly effervescent; moderately alkaline; clear wavy boundary.

C—54 to 63 inches; light olive brown (2.5Y 5/4) sandy loam that has thin strata of brown (10YR 5/3) loamy sand and silty clay loam; massive; friable; common medium distinct olive gray (5Y 5/2) and common fine prominent gray (10YR 5/1) iron depletions in the matrix; common fine and medium prominent strong brown

(7.5YR 5/6) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 2 percent subangular limestone fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

C´g—63 to 73 inches; olive gray (5Y 5/2) very fine sandy loam; massive; friable; many medium faint gray (5Y 5/1) iron depletions in the matrix; common fine and medium prominent dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 1 percent subangular shale fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

2C—73 to 80 inches; brown (10YR 4/3) very gravelly loamy sand; single grain; loose; 45 percent subangular limestone and 5 percent shale fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 36 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 24 to 50 inches
Depth to sandy and gravelly material: 60 to 80 inches
Content of rock fragments: 0 percent in Ap, BA, and Bg horizons; 0 to 2 percent in BCg horizon; 0 to 5 percent in C and Cg horizons; 15 to 59 percent in 2C horizon

Ap horizon:
Color—hue of 10YR or 2.5Y, value of 2, 2.5, or 3, and chroma of 1 or 2
Texture—silty clay loam

BA horizon (if it occurs):
Color—hue of 10YR, value of 2 or 3, and chroma of 1 or 2
Texture—silty clay loam

Bg horizon:
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2
Texture—silty clay loam or silty clay

BC or BCg horizon:
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4
Texture—silty clay loam, silty clay, or silt loam

Cg or C horizon:
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4
Texture—clay loam, silt loam, sandy loam, silty clay loam, or very fine sandy loam; horizon may be stratified with textures ranging from loamy sand to silty clay loam

2C horizon (in gravelly substratum phase):
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—gravelly or very gravelly loamy sand

Millsdale Series

Depth class: Moderately deep
Drainage class: Very poorly drained
Parent material: Till over limestone
Landform: Depressions and flats on the Wisconsinan terraces and till plains
Slope range: 0 to 2 percent
Adjacent soils: Randolph, Milton, and Plattville
Taxonomic class: Fine, mixed, active, mesic Typic Argiaquolls

Typical Pedon

Millsdale silt loam, 0 to 2 percent slopes; about 2.7 miles south of West Alexandria, in Lanier Township, Preble County, Ohio; 2,000 feet east and 1,450 feet south of the northwest corner of sec. 15, T. 5 N., R. 3 E.

Ap—0 to 9 inches; black (2.5Y 2.5/1) silt loam, very dark gray (2.5Y 3/1) dry; weak fine subangular blocky structure; friable; common fine roots; few faint black (10YR 2/1) organic coatings on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation on faces of peds; neutral; clear smooth boundary.

A—9 to 16 inches; black (2.5Y 2.5/1) silt loam, very dark gray (2.5Y 3/1) dry; weak fine and medium subangular blocky structure; friable; common fine roots; common faint black (10YR 2/1) organic coatings on faces of peds; few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation on faces of peds; neutral; clear smooth boundary.

Btg1—16 to 22 inches; dark gray (2.5Y 4/1) silty clay; moderate medium subangular blocky structure; firm; few fine roots; many faint dark gray (10YR 4/1) clay films throughout; many distinct very dark gray (10YR 3/1) organic coatings throughout; many fine prominent brownish yellow (10YR 6/8) masses of iron accumulation on faces of peds; 5 percent rock fragments; neutral; clear smooth boundary.

Btg2—22 to 25 inches; grayish brown (2.5Y 5/2) clay; moderate medium and coarse subangular blocky structure; firm; few fine roots; many distinct dark gray (10YR 4/1) clay films throughout; few distinct very dark gray (10YR 3/1) organic coatings throughout; many fine prominent brownish yellow (10YR 6/8) masses of iron accumulation throughout; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; neutral; abrupt wavy boundary.

2R—25 to 29 inches; light gray (10YR 7/2) limestone bedrock.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches
Depth to bedrock: 20 to 40 inches
Content of rock fragments: 0 to 1 percent in Ap horizon; 1 to 10 percent in Btg horizon

Ap or A horizon:
Color—hue of 10YR or 2.5Y, value of 2, 2.5, or 3, and chroma of 1 or 2
Texture—silt loam or silty clay loam

Btg horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 2
Texture—silty clay, clay, or clay loam

2R horizon:
Bedrock—limestone

Milton Series

Depth class: Moderately deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying till over limestone
Landform: Wisconsinan till plains
Position on the landform: Summits, shoulders, and backslopes
Slope range: 0 to 25 percent
Adjacent soils: Randolph, Millsdale, and Plattville
Taxonomic class: Fine, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Milton silt loam, 2 to 6 percent slopes; about 3.3 miles south of West Alexandria, in Lanier Township, Preble County, Ohio; 1,900 feet south and 305 feet west of the northeast corner of sec. 21, T. 5 N., R. 3 E.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; common very fine to medium roots; few fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; neutral; abrupt smooth boundary.

Bt1—9 to 16 inches; dark yellowish brown (10YR 4/4) silty clay; moderate medium and coarse subangular blocky structure; firm; common fine and very fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 5/3) silt coatings on faces of peds; few fine distinct strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 1 percent igneous fragments; neutral; clear smooth boundary.

Bt2—16 to 21 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; few fine and very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; common fine distinct light gray (10YR 7/1) masses of calcium carbonate accumulation in the matrix; 1 percent shale fragments and 2 percent limestone fragments; neutral; clear wavy boundary.

BC—21 to 28 inches; yellowish brown (10YR 5/4) loam; weak fine and medium subangular blocky structure; friable; common fine roots in cracks; few distinct brown (10YR 4/3) clay films on vertical faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions on vertical faces of peds; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation between peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; common distinct light gray (10YR 7/2) calcium carbonate coatings on faces of peds; 1 percent shale fragments and 5 percent limestone fragments; slightly effervescent; slightly alkaline; abrupt smooth boundary.

2R—28 to 32 inches; white (10YR 8/1) limestone bedrock.

Range in Characteristics

Depth to bedrock: 20 to 40 inches
Thickness of the solum: 20 to 40 inches
Depth to carbonates: 18 to 30 inches
Thickness of the loess mantle: 6 to 12 inches
Content of rock fragments: 0 to 5 percent in Ap horizon; 1 to 10 percent in Bt horizon; 5 to 25 percent in BC horizon

Ap horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6
Texture—clay loam, clay, or silty clay

BC horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam or loam or their gravelly or channery analogues

2R horizon:
Bedrock—limestone

Morningsun Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loess and the underlying water-modified till
Landform: Flats and slight rises on the Wisconsinan ground moraines
Position on the landform: Summits and shoulders
Slope range: 0 to 6 percent
Adjacent soils: Cyclone, Fincastle, Sugarvalley, and Xenia
Taxonomic class: Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs

Typical Pedon

Morningsun silt loam, 0 to 2 percent slopes; about 1 mile southwest of West Florence, in Dixon Township, Preble County, Ohio; about 1,000 feet west and 250 feet south of the northeast corner of sec. 8, T. 7 N., R. 1 E.

Ap—0 to 10 inches; dark yellowish brown (10YR 4/4) silt loam, light yellowish brown (10YR 6/4) dry; weak fine and medium subangular blocky structure; friable; common fine and few medium roots throughout; very strongly acid; abrupt smooth boundary.

Bt1—10 to 17 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; common fine roots throughout; common distinct yellowish brown (10YR 5/6) clay films on faces of peds; common distinct brown (10YR 5/3) clay depletions on faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; abrupt smooth boundary.

Bt2—17 to 24 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; few very fine roots throughout; many distinct yellowish brown (10YR 5/6) clay films on faces of peds; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; clear smooth boundary.

Bt3—24 to 33 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; firm; few very fine roots throughout; many distinct yellowish brown (10YR 5/6) clay films on faces of peds; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; 2 percent igneous gravel; neutral; clear wavy boundary.

2Bt4—33 to 42 inches; yellowish brown (10YR 5/8) silt loam; weak coarse subangular blocky structure; firm; few very fine roots throughout; few distinct yellowish brown (10YR 5/6) clay films on faces of peds; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; about 37 percent sand; 10 percent subrounded igneous gravel; slightly alkaline; clear wavy boundary.

2BC—42 to 51 inches; dark yellowish brown (10YR 3/4) gravelly sandy loam; weak coarse subangular blocky structure; friable; few very fine roots; few distinct dark yellowish brown (10YR 4/6) clay bridging between sand grains and clay films coating pebbles; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 20 percent subrounded igneous gravel; strongly effervescent; slightly alkaline; abrupt smooth boundary.

2C1—51 to 63 inches; dark yellowish brown (10YR 4/6) sandy loam; massive; friable; 10 percent subrounded igneous gravel; strongly effervescent; slightly alkaline; abrupt smooth boundary.

2C2—63 to 80 inches; dark yellowish brown (10YR 4/6) gravelly loam that has pockets of sandy loam and loamy sand; massive; firm; 10 percent subrounded and 5 percent subangular igneous gravel; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 35 to 80 inches
Depth to carbonates: 40 to 60 inches
Thickness of the loess mantle: 25 to 50 inches
Content of rock fragments: 0 to 2 percent in Ap and Bt horizons; 0 to 10 percent in 2Bt horizon; 5 to 25 percent in 2BC and 2C horizons

Ap horizon:
Color—hue of 10YR, value of 4, and chroma of 3 or 4
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—silt loam or silty clay loam

2Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture—silt loam, loam, or clay loam

2BC horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 3 or 4
Texture—loam, clay loam, or sandy loam or their gravelly analogues

2C horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—loam or sandy loam or their gravelly analogues; strata or pockets of loamy sand or sandy loam occur in some pedons

Ockley Series

Depth class: Very deep
Drainage class: Well drained
Parent material: A thin layer of loess and loamy outwash over stratified sand and gravel
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope range: 0 to 6 percent
Adjacent soils: Fox, Eldean, Thackery, and Warsaw
Taxonomic class: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Ockley silt loam, 0 to 2 percent slopes; about 1.4 miles southwest of West Elkton, in Gratis Township, Preble County, Ohio; about 2,275 feet west and 1,700 feet south of the northeast corner of sec. 31, T. 4 N., R. 3 E.

Ap1—0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure parting to weak medium granular; friable; many fine and medium roots; 1 percent subangular limestone gravel; slightly acid; clear smooth boundary.

Ap2—5 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak medium and coarse subangular blocky structure parting to weak thin and medium platy; friable; common fine and medium roots; 1 percent subangular limestone gravel; neutral; abrupt smooth boundary.

Bt1—9 to 15 inches; yellowish brown (10YR 5/4) clay loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; common distinct brown (10YR 4/3) clay films on faces of peds; few faint brown (10YR 5/3) clay depletions on faces of peds; 1 percent subangular limestone gravel; neutral; clear smooth boundary.

Bt2—15 to 22 inches; yellowish brown (10YR 5/4) clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common distinct brown (7.5YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt3—22 to 31 inches; brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; firm; common fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent subangular shale fragments and 6 percent subrounded limestone gravel; slightly acid; clear wavy boundary.

Bt4—31 to 38 inches; dark yellowish brown (10YR 4/4) sandy clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 2 percent subangular shale fragments, 3 percent igneous gravel, and 4 percent subrounded limestone gravel; slightly acid; gradual wavy boundary.

Bt5—38 to 48 inches; brown (10YR 4/3) clay loam and sandy clay loam; weak fine subangular blocky structure; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; 3 percent subangular shale fragments, 5 percent igneous gravel, and 4 percent subrounded limestone gravel; slightly acid; gradual wavy boundary.

2C1—48 to 58 inches; brown (10YR 5/3) stratified gravelly loamy sand and sand; single grain; loose; 2 percent subangular shale fragments, 8 percent igneous gravel, and 20 percent subrounded limestone gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2—58 to 80 inches; brown (10YR 5/3) stratified very gravelly sand and loamy sand; single grain; loose; few fine prominent reddish yellow (7.5YR 6/8) iron concretions in the matrix; 2 percent subangular shale fragments, 10 percent igneous gravel, and 35 percent subrounded limestone gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 72 inches
Depth to carbonates: 40 to 72 inches
Thickness of the loess mantle: 0 to 20 inches
Content of rock fragments, mostly gravel: 0 to 10 percent in Ap horizon; 0 to 10 percent in the upper part of Bt horizon; 10 to 45 percent in the lower part of Bt horizon; 30 to 70 percent in 2C horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam or sandy clay loam or their gravelly or very gravelly analogues

2C horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 3 or 4
Texture—the gravelly to extremely gravelly analogues of loamy sand or sand and strata of loamy sand or sand

Plattville Series

Depth class: Deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying outwash and residuum weathered from limestone
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Backslopes
Slope range: 2 to 6 percent
Adjacent soils: Millsdale, Milton, and Randolph
Taxonomic class: Fine-loamy, mixed, active, mesic Typic Argiudolls

Typical Pedon

Plattville silt loam, moderately wet, 2 to 6 percent slopes; about 2.5 miles south of West Alexandria, in Lanier Township, Preble County, Ohio; about 2,000 feet north and 500 feet west of the southeast corner of sec. 16, T. 5 N., R. 3 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine and medium subangular blocky structure; friable; many fine roots; many faint very dark gray (10YR 3/1) organic coatings throughout; 1 percent rock fragments; slightly acid; abrupt smooth boundary.

A—9 to 18 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine and medium subangular blocky structure; friable; common fine roots; many faint black (10YR 2/1) organic coatings throughout; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt1—18 to 31 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few faint brown (10YR 5/3) clay depletions in the matrix; few fine prominent brownish yellow (10YR 6/8) and few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common very dark gray (10YR 3/1) krotovinas; 1 percent rock fragments; slightly acid; clear smooth boundary.

Bt2—31 to 43 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few faint brown (10YR 5/3) clay depletions in the matrix; few fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; neutral; clear smooth boundary.

BC1—43 to 50 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on vertical faces of peds; few fine distinct brown (10YR 5/2) iron depletions in the matrix; many fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; common medium faint very pale brown (10YR 7/3) masses of secondary carbonates throughout; 10 percent rock fragments; slightly alkaline; clear wavy boundary.

2BC2—50 to 54 inches; brown (10YR 5/3) clay; weak coarse subangular blocky

structure; firm; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few fine prominent yellowish red (5YR 5/8) and few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; 5 percent rock fragments; slightly alkaline; clear smooth boundary.

2R—54 to 58 inches; light gray (10YR 7/2) limestone bedrock.

Range in Characteristics

Depth to bedrock: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the loess mantle: 0 to 18 inches
Content of rock fragments: 0 to 2 percent in Ap horizon; 0 to 7 percent in Bt horizon; 2 to 10 percent in BC and 2BC horizons

Ap or A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Texture—silt loam

Bt horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—loam, clay loam, or silty clay loam

BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—loam or clay loam

2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay

2R horizon:
Bedrock—limestone

The Plattville soils in Preble County are considered taxadjuncts to the Plattville series because they have redoximorphic features in the lower part of the solum, which are not defined in the ranges for the series. These soils classify as fine-loamy, mixed, active, mesic Oxyaquic Argiudolls. This difference, however, does not significantly affect use and management.

Rainsville Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: A thin layer of loess and the underlying loamy outwash and till
Landform: Wisconsinan ground moraines
Position on the landform: Summits and backslopes
Slope range: 0 to 6 percent
Adjacent soils: Fox and Kendallville
Taxonomic class: Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs

Typical Pedon

Rainsville silt loam, 2 to 6 percent slopes; about 1.5 miles southwest of West Alexandria, in Lanier Township, Preble County, Ohio; about 330 feet west and 2,245 feet north of the southeast corner of sec. 9, T. 5 N., R. 3 E.

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine

subangular blocky structure; friable; many fine to coarse roots; many faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; strongly acid; abrupt smooth boundary.

Bt1—10 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine and medium subangular blocky structure; friable; many fine and common medium and coarse roots; common distinct brown (10YR 4/3) clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds and along root channels; strongly acid; clear smooth boundary.

2Bt2—16 to 26 inches; brown (7.5YR 5/4) loam; moderate medium subangular blocky structure; firm; common fine to coarse roots; many distinct brown (10YR 4/3) clay films on faces of peds; few fine prominent yellowish red (5YR 5/8) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rounded limestone gravel and 2 percent rounded igneous gravel; very strongly acid; clear wavy boundary.

2Bt3—26 to 35 inches; brown (7.5YR 5/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine and coarse roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine faint brown (10YR 5/3) iron depletions in the matrix; few fine and medium prominent red (2.5YR 4/6) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation in the matrix; common medium and coarse prominent cylindrical yellowish red (5YR 5/8) ironstone nodules in the matrix; 2 percent rounded limestone gravel and 3 percent rounded igneous gravel; very strongly acid; clear wavy boundary.

2Bt4—35 to 44 inches; brown (7.5YR 4/4) clay loam; moderate medium and coarse subangular blocky structure; firm; common fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) and common fine faint brown (10YR 5/3) iron depletions in the matrix; common fine and medium prominent red (2.5YR 4/6) masses of iron accumulation in the matrix; few fine prominent irregular yellowish red (5YR 5/8) ironstone nodules in the matrix; 2 percent rounded limestone gravel and 5 percent rounded igneous gravel; strongly acid; clear wavy boundary.

3Bt5—44 to 50 inches; brown (10YR 5/3) loam; weak fine and medium subangular blocky structure; firm; common fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on vertical faces of peds; 2 percent rounded limestone gravel and 8 percent rounded igneous gravel; neutral; clear wavy boundary.

3C1—50 to 59 inches; brown (10YR 5/3) gravelly loam; massive; firm; 2 percent subangular igneous fragments and 13 percent subangular limestone fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

3C2—59 to 80 inches; brown (10YR 5/4) gravelly loam that has common pockets of gravelly sandy loam; massive; firm; 5 percent subangular igneous fragments and 15 percent subangular limestone fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 45 to 60 inches
Depth to carbonates: 32 to 50 inches
Thickness of the loess mantle: 0 to 20 inches
Content of rock fragments: 0 to 2 percent in Ap horizon or in Bt horizon formed in loess; 1 to 10 percent in Bt or 2Bt horizon formed in outwash; 2 to 10 percent in 2Bt or 3Bt horizon formed in till; 3 to 20 percent in 2C or 3C horizon formed in till

Ap or A horizon:
Color—hue of 10YR, value of 4, and chroma of 2 or 3
Texture—silt loam

Bt horizon formed in loess (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4
Texture—silty clay loam or silt loam

Bt or 2Bt horizon formed in outwash:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6
Texture—clay loam or loam

2Bt or 3Bt horizon formed in till:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam or loam

2C or 3C horizon formed in till:
Color—hue of 10YR, value of 5, and chroma of 3 or 4
Texture—loam, gravelly loam, or gravelly sandy loam

Randolph Series

Depth class: Moderately deep
Drainage class: Somewhat poorly drained
Parent material: Till over limestone
Landform: Flats and rises on the Wisconsinan till plains
Position on the landform: Summits
Slope range: 0 to 6 percent
Adjacent soils: Millsdale and Milton
Taxonomic class: Fine, mixed, active, mesic Aeric Endoaqualfs

Typical Pedon

Randolph silt loam, 0 to 2 percent slopes; about 3 miles south and 0.25 mile west of West Alexandria, in Lanier Township, Preble County, Ohio; about 940 feet west and 200 feet south of the northeast corner of sec. 21, T. 5 N., R. 3 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium subangular blocky structure parting to moderate medium granular; friable; common fine roots; few fine faint black (10YR 2/1) manganese concretions in the matrix; few fine faint black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; moderately acid; clear wavy boundary.

AB—6 to 10 inches; dark gray (10YR 4/1) silt loam; moderate medium subangular blocky structure; firm; common fine roots; common fine prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; few fine and medium faint black (10YR 2/1) masses of manganese accumulation in the matrix; 1 percent rock fragments; very strongly acid; clear smooth boundary.

Bt1—10 to 21 inches; brown (10YR 4/3) silty clay; strong coarse subangular blocky structure; very firm; common fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; many fine and medium faint grayish brown (10YR 5/2) iron depletions in the matrix; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent rock fragments; very strongly acid; clear wavy boundary.

Bt2—21 to 27 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent rock fragments; slightly acid; clear wavy boundary.

Bt3—27 to 33 inches; light olive brown (2.5Y 5/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; common distinct very dark gray (10YR 3/1) clay films on vertical faces of peds; many distinct dark gray (10YR 4/1) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; 1 percent rock fragments; neutral; clear smooth boundary.

2R—33 to 35 inches; light gray (10YR 7/1) limestone bedrock.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Content of rock fragments: 0 to 3 percent in Ap horizon; 0 to 3 percent in the upper part of Bt horizon; 1 to 14 percent in the lower part of Bt horizon

Ap horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3
Texture—silt loam

AB horizon (if it occurs):
Color—hue of 10YR, value of 4, and chroma of 1
Texture—silt loam

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4
Texture—silty clay loam, clay loam, silty clay, or clay

2R horizon:
Bedrock—limestone

Rodman Series

Depth class: Very deep
Drainage class: Excessively drained
Parent material: Outwash
Landform: Outwash plains and kames
Position on the landform: Backslopes
Slope range: 18 to 50 percent
Adjacent soils: Kendallville and Rainsville
Taxonomic class: Sandy-skeletal, mixed, mesic Typic Hapludolls

Typical Pedon

Rodman gravelly loam in an area of Rodman-Kendallville complex, 25 to 50 percent slopes, eroded; about 0.8 mile north of New Paris, in Jefferson Township, Preble County, Ohio; about 925 feet east and 1,050 feet south of the northwest corner of sec. 20, T. 9 N., R. 1 E.

Oe—0 to 1 inch; decomposed leaves, grasses, and twigs.

A—1 to 4 inches; very dark gray (10YR 3/1) gravelly loam, dark gray (10YR 4/1) dry; weak very fine granular structure; very friable; many fine and medium and common coarse roots throughout; 30 percent gravel; neutral; abrupt wavy boundary.

Bw—4 to 12 inches; dark brown (7.5YR 3/2) very gravelly loam, brown (7.5YR 5/2) dry; weak fine subangular blocky structure; very friable; many fine to coarse roots throughout; many faint very dark brown (7.5YR 2.5/2) organic coatings on faces of peds; 40 percent gravel; neutral; abrupt wavy boundary.

C1—12 to 15 inches; yellowish brown (10YR 5/4) very gravelly sandy loam; single grain; loose; many fine roots; 50 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.
C2—15 to 25 inches; yellowish brown (10YR 5/4) extremely gravelly loamy coarse sand; single grain; loose; common fine and medium roots; 60 percent gravel; violently effervescent; moderately alkaline; abrupt smooth boundary.
C3—25 to 80 inches; yellowish brown (10YR 5/4) extremely gravelly loamy coarse sand; single grain; loose; common medium roots; 75 percent gravel; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 10 to 20 inches
Thickness of the mollic epipedon: 10 to 14 inches
Depth to carbonates: 10 to 20 inches
Content of rock fragments: 15 to 30 percent in A horizon; 10 to 40 percent in Bw horizon; 35 to 78 percent in C horizon

A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 or 2
Texture—gravelly loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3
Texture—loam, coarse sandy loam, or sandy loam or their gravelly or very gravelly analogues

C horizon:
Color—hue of 10YR, value of 3 to 6, and chroma of 1 to 4
Texture—very gravelly or extremely gravelly analogues of sandy loam, loamy coarse sand, or sand; the sandy loam fine-earth texture only occurs in the upper part of horizon

Rossburg Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loamy alluvium over sandy and gravelly alluvium
Landform: Flood plains
Slope range: 0 to 1 percent
Adjacent soils: Medway, Sloan, and Stonelick
Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls

Typical Pedon

Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded; about 0.75 mile northwest of Gratis, in Gratis Township, Preble County, Ohio; about 126 feet west and 420 feet south of the northeast corner of sec. 4, T. 4 N., R. 3 E.

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; moderate fine subangular blocky structure; friable; common fine and medium roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; abrupt smooth boundary.
A—8 to 18 inches; dark brown (10YR 3/3) silt loam, brown (10YR 4/3) dry; moderate

medium subangular blocky structure; friable; many fine, common medium, and few coarse roots; many distinct very dark grayish brown (10YR 3/2) organic coatings throughout; 2 percent gravel; slightly alkaline; clear wavy boundary.

Bw1—18 to 27 inches; brown (10YR 4/3) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; common very fine and fine and few medium roots; many distinct very dark grayish brown (10YR 3/2) organic coatings on faces of peds; 2 percent gravel; slightly alkaline; clear wavy boundary.

Bw2—27 to 35 inches; dark yellowish brown (10YR 4/4) loam; weak coarse prismatic structure; friable; few fine and medium roots; common distinct very dark grayish brown (10YR 3/2) organic coatings throughout; 2 percent gravel; slightly alkaline; abrupt wavy boundary.

C1—35 to 41 inches; yellowish brown (10YR 5/4) loam; massive; friable; few fine roots; few distinct very dark grayish brown (10YR 3/2) organic coatings along worm and root channels; 4 percent gravel; strongly effervescent; moderately alkaline; clear wavy boundary.

C2—41 to 52 inches; brown (10YR 5/3) sandy loam; massive; friable; common medium faint grayish brown (10YR 5/2) iron depletions throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; 2 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C3—52 to 63 inches; brown (10YR 5/3) and grayish brown (10YR 5/2) sand; single grain; loose; 2 percent gravel; strongly effervescent; moderately alkaline; abrupt wavy boundary.

2C4—63 to 80 inches; yellowish brown (10YR 5/4) extremely gravelly sand; single grain; loose; common fine roots; common medium distinct grayish brown (10YR 5/2) iron depletions throughout; common medium distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; 60 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to sandy materials: 40 to 65 inches
Depth to carbonates: 30 to 60 inches
Content of rock fragments: 0 to 5 percent in Ap horizon; 0 to 10 percent in Bw horizon; 0 to 20 percent in C horizon above depth of 48 inches and 0 to 34 percent in C horizon below depth of 48 inches, with as much as 60 percent in individual stratum

Ap or A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Texture—silt loam

Bw horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 to 6
Texture—silt loam or loam; the lower part of horizon is fine sandy loam or sandy loam in some pedons

C horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 3 to 6
Texture—loam, silt loam, fine sandy loam, sandy loam, or loamy sand or their gravelly or very gravelly analogues

2C horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 2 to 6
Texture—sand or its gravelly to extremely gravelly analogues

Russell Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Loess and the underlying till
Landform: Slight rises on the Wisconsinan till plains
Position on the landform: Summits and shoulders
Slope range: 2 to 6 percent
Adjacent soils: Fincastle, Miamian, and Xenia
Taxonomic class: Fine-silty, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Russell silt loam in an area of Russell-Miamian silt loams, 2 to 6 percent slopes; about 1.5 miles southwest of Fairhaven, in Israel Township, Preble County, Ohio; about 2,366 feet south and 88 west of the northeast corner of sec. 7, T. 6 N., R. 1 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bt1—8 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; neutral; clear wavy boundary.

Bt2—21 to 35 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; slightly acid; clear wavy boundary.

2Bt3—35 to 50 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; firm; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 3 percent rock fragments; moderately acid; clear wavy boundary.

2Bt4—50 to 58 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium and fine subangular blocky structure; firm; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent rock fragments; slightly acid; abrupt wavy boundary.

2Cd1—58 to 65 inches; brown (10YR 5/3) loam; massive; firm; few medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent rock fragments; strongly effervescent; moderately alkaline; clear wavy boundary.

2Cd2—65 to 80 inches; brown (10YR 5/3) gravelly loam; massive; firm; few fine faint grayish brown (10YR 5/2) iron depletions throughout; few medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in rinds around the depletions; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 15 percent rock fragments; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 40 to 60 inches
Thickness of the loess mantle: 20 to 40 inches
Content of rock fragments: 0 to 2 percent in Ap and Bt horizons; 2 to 10 percent in 2Bt horizon; 2 to 15 percent in 2Cd horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—silt loam or silty clay loam

2Bt horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam, loam, or silty clay loam

2Cd horizon:
Color—hue of 10YR or 2.5Y, value of 5, and chroma of 3 to 6
Texture—loam or gravelly loam

Savona Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Silty material and the underlying outwash having a high content of limestone gravel and sand
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope range: 0 to 2 percent
Adjacent soils: Eldean, Lippincott, Milford, and Ockley
Taxonomic class: Fine, mixed, superactive, mesic Aeric Endoaqualfs

Typical Pedon

Savona silt loam, 0 to 2 percent slopes; about 50 feet west of New Madison, in Harrison Township, Darke County, Ohio; 320 feet west and 740 feet north of the center of sec. 13, T. 10 N., R. 1 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, pale brown (10YR 6/3) dry; weak fine subangular blocky structure; friable; common fine roots; 2 percent gravel; neutral; abrupt smooth boundary.

Bt1—7 to 10 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common prominent yellowish brown (10YR 5/8) clay films on faces of peds; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; many (55 percent) medium distinct grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation on faces of peds; 2 percent gravel; neutral; clear wavy boundary.

Bt2—10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots; common prominent yellowish brown (10YR 5/8) clay films on faces of peds; many (55 percent) medium distinct grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation on faces of peds; 2 percent gravel; neutral; clear wavy boundary.

Bt3—15 to 20 inches; yellowish brown (10YR 5/4) clay; moderate medium subangular blocky structure; firm; few fine roots; many faint gray (10YR 5/1) clay films on faces of peds; many (30 percent) medium distinct grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses

of manganese accumulation on faces of peds; 10 percent gravel; neutral; clear wavy boundary.

Bt4—20 to 29 inches; brown (10YR 5/3) very gravelly clay; moderate medium subangular blocky structure; firm; few very fine roots; many distinct gray (10YR 5/1) clay films on faces of peds; many (25 percent) medium faint grayish brown (10YR 5/2) iron depletions on faces of peds; common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation on faces of peds; 38 percent gravel; neutral; clear wavy boundary.

BC—29 to 45 inches; brown (10YR 5/3) very gravelly loam; weak coarse subangular blocky structure; friable; few very fine roots; 35 percent sedimentary and 8 percent metamorphic rock fragments; slightly effervescent; moderately alkaline; diffuse wavy boundary.

C—45 to 80 inches; brown (10YR 5/3) very gravelly coarse sand; single grain; loose; 46 percent sedimentary and 4 percent metamorphic rock fragments; violently effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 30 to 55 inches
Depth to carbonates: 24 to 40 inches
Depth to sandy or sandy-skeletal material: 40 to 60 inches
Content of rock fragments: 0 to 5 percent in Ap horizon; 0 to 14 percent in the upper part of Bt horizon; 15 to 40 percent in the lower part of Bt horizon; 15 to 59 percent in BC horizon; 35 to 75 percent in C horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 1 to 3
Texture—silt loam

Bt or Btg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4
Texture—clay, clay loam, silt loam, or silty clay loam in the upper part of horizon and gravelly or very gravelly analogues of sandy clay loam, clay loam, clay, or loam in the lower part

BC or BCg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4
Texture—gravelly or very gravelly analogues of loam, sandy loam, coarse sandy loam, or silt loam

C or Cg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 6
Texture—very gravelly or extremely gravelly analogues of loamy sand, sand, loamy coarse sand, or coarse sand; horizon commonly is stratified

Sloan Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy alluvium over sandy alluvium
Landform: Flood plains
Slope range: 0 to 1 percent
Adjacent soils: Eel and Medway
Taxonomic class: Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls

Typical Pedon

Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded; about 5.3

miles north of New Paris, in Jefferson Township, Preble County, Ohio; about 251 feet south and 160 feet west of the northeast corner of sec. 5, T. 9 N., R. 1 E.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Bg1—10 to 18 inches; dark gray (10YR 4/1) silty clay loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds and in root channels; many fine and medium prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint black (10YR 2/1) masses of manganese accumulation throughout; neutral; abrupt wavy boundary.

Bg2—18 to 22 inches; dark gray (10YR 4/1) loam; weak medium and coarse subangular blocky structure; firm; few fine roots; common faint gray (10YR 5/1) iron depletions on faces of peds; many fine and medium prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; clear wavy boundary.

Bg3—22 to 27 inches; dark gray (10YR 4/1) silty clay loam; weak medium and coarse subangular blocky structure; firm; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; clear wavy boundary.

BCg—27 to 45 inches; very dark gray (10YR 3/1) clay loam; weak coarse subangular blocky structure; friable; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; few prominent light gray (10YR 7/2) masses of calcium carbonate accumulation around gravel; 10 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

C1—45 to 60 inches; brown (10YR 4/3) gravelly sandy loam; massive; friable; common medium faint yellowish brown (10YR 5/4) and many medium prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common distinct light gray (10YR 7/2) masses of calcium carbonate accumulation around gravel; 30 percent gravel; strongly effervescent; slightly alkaline; abrupt wavy boundary.

2C2—60 to 80 inches; brown (10YR 5/3) very gravelly loamy coarse sand; single grain; loose; 55 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 20 to 60 inches
Thickness of the mollic epipedon: 10 to 24 inches
Depth to carbonates: 22 to 80 inches
Depth to sandy material: 60 inches or more
Content of gravel: 0 to 5 percent in Ap and Bg horizons; 0 to 34 percent in BCg and C horizons; 0 to 55 percent in 2C horizon

Ap horizon:
Color—hue of 10YR or 2.5Y, value of 2, 2.5, or 3, and chroma of 1 or 2
Texture—silt loam

Bg horizon:
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 3 to 5, and has chroma of 0 to 2
Texture—silty clay loam, clay loam, silt loam, or loam

BCg or BC horizon:
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 3 to 6, and has chroma of 0 to 4
Texture—silty clay loam, clay loam, silt loam, or loam

Cg or C horizon:
Color—hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4
Texture—silty clay loam, clay loam, loam, or sandy loam or their gravelly analogues

2C or 2Cg horizon:
Color—hue of 10YR to 5Y, value of 3 to 6, and chroma of 1 to 4
Texture—loamy sand, loamy coarse sand, or sand or their gravelly or very gravelly analogues

Stonelick Series

Depth class: Very deep
Drainage class: Well drained
Parent material: Calcareous, loamy and sandy alluvium over gravelly alluvium
Landform: Flood plains
Slope range: 0 to 1 percent
Adjacent soils: Rossburg and Eel
Taxonomic class: Coarse-loamy, mixed, superactive, calcareous, mesic Typic Udifluvents

Typical Pedon

Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded; about 1.7 miles east of Gratis, in Gratis Township, Preble County, Ohio; about 1,300 feet south and 1,800 feet east of the northwest corner of sec. 2, T. 4 N., R. 3 E.

Ap—0 to 10 inches; brown (10YR 4/3) loam, pale brown (10YR 6/3) dry; weak fine and medium granular structure; friable; common fine roots; few faint very dark grayish brown (10YR 3/2) organic coatings throughout; slightly effervescent; moderately alkaline; clear smooth boundary.
C1—10 to 18 inches; brown (10YR 4/3) fine sandy loam; massive; friable; few fine roots; slightly effervescent; moderately alkaline; clear wavy boundary.
C2—18 to 26 inches; brown (10YR 4/3) fine sandy loam; massive; friable; few fine roots; 2 percent gravel; violently effervescent; moderately alkaline; clear smooth boundary.
C3—26 to 30 inches; brown (10YR 5/3) loamy sand; single grain; loose; 5 percent gravel; violently effervescent; moderately alkaline; clear wavy boundary.
2C4—30 to 80 inches; brown (10YR 5/3) very gravelly loamy sand; single grain; loose; 50 percent gravel and 10 percent cobbles; violently effervescent; moderately alkaline.

Range in Characteristics

Carbonates: Typically throughout the profile
Depth to gravelly material: 30 inches or more
Content of rock fragments: 0 to 5 percent in Ap horizon; 0 to 14 percent in C horizon; 15 to 50 percent in 2C horizon

Ap horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 2 to 4
Texture—loam

C horizon:

Color—hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4

Texture—horizon is stratified with loam, sandy loam, fine sandy loam, or loamy sand

2C horizon:

Color—hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 2 to 4

Texture—gravelly or very gravelly analogues of loamy sand, loamy coarse sand, or sand

Sugarvalley Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Parent material: Loess and the underlying water-modified till
Landform: Flats on the Wisconsinan ground moraines
Position on the landform: Summits
Slope range: 0 to 2 percent
Adjacent soils: Cyclone, Fincastle, Morningsun, and Xenia
Taxonomic class: Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Typical Pedon

Sugarvalley silt loam, 0 to 2 percent slopes; about 3.2 miles north of Fairhaven, in Dixon Township, Preble County, Ohio; about 600 feet west and 400 feet north of the southeast corner of sec. 20, T. 7 N., R. 1 E.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium subangular blocky structure; friable; many fine and very fine roots throughout; common fine prominent strong brown (7.5YR 4/6) masses of iron accumulation throughout; common fine faint dark brown (10YR 3/3) masses of iron and manganese accumulation throughout; very strongly acid; abrupt smooth boundary.

BE—10 to 16 inches; brown (10YR 5/3) silt loam; weak fine and medium subangular blocky structure; friable; many fine and very fine roots throughout; few distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; common medium faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation throughout; common fine faint very dark grayish brown (10YR 3/2) masses of iron and manganese accumulation throughout; strongly acid; clear wavy boundary.

Bt1—16 to 30 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; many fine roots throughout; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine and medium distinct strong brown (7.5YR 5/6) masses of iron accumulation throughout; common fine and medium distinct very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; common coarse distinct very dark gray (10YR 3/1) iron and manganese concretions throughout; moderately acid; clear wavy boundary.

Bt2—30 to 41 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; many fine roots throughout; common distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine and medium prominent very dark gray (10YR 3/1)

masses of iron and manganese accumulation throughout; neutral; clear smooth boundary.

2Bt3—41 to 51 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; many fine roots throughout; common distinct gray (10YR 5/1) clay films on faces of peds; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; many medium distinct strong brown (7.5YR 5/8) masses of iron accumulation throughout; common fine prominent very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; about 28 percent sand; 8 percent rock fragments; slightly alkaline; clear smooth boundary.

2BC—51 to 61 inches; yellowish brown (10YR 5/4) gravelly loam; weak coarse subangular blocky structure; firm; common fine roots between peds; few distinct yellowish brown (10YR 5/4) clay films along root channels and on vertical faces of peds; common medium distinct grayish brown (10YR 5/2) iron depletions in the matrix; few medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; few fine distinct very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; 5 percent subrounded shale fragments and 15 percent subrounded limestone fragments; strongly effervescent; slightly alkaline; gradual wavy boundary.

2C—61 to 80 inches; brown (10YR 5/3) gravelly sandy loam; massive; friable; few fine roots throughout to a depth of 68 inches; common medium faint grayish brown (10YR 5/2) iron depletions throughout; common medium prominent strong brown (7.5YR 5/8) masses of iron accumulation throughout; pockets of grayish brown (2.5Y 5/2) and gray (10YR 5/1) clay loam with common coarse prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout the pockets; few fine distinct very dark gray (10YR 3/1) masses of iron and manganese accumulation throughout; 5 percent subrounded limestone fragments and 10 percent subrounded granite fragments; violently effervescent; slightly alkaline.

Range in Characteristics

Thickness of the solum: 35 to 75 inches
Depth to carbonates: 40 to 60 inches
Thickness of the loess mantle: 30 to 50 inches
Content of rock fragments: 0 to 2 percent in Ap and Bt horizons; 0 to 10 percent in 2Bt horizon; 5 to 25 percent in 2BC and 2C horizons

Ap horizon:
Color—hue of 10YR or 2.5Y, value of 4, and chroma of 2 or 3
Texture—silt loam

E horizon (if it occurs):
Color—hue of 10YR or 2.5Y, value of 5, and chroma of 2 or 3
Texture—silt loam

BE horizon (if it occurs):
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4
Texture—silt loam

Bt horizon:
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 6
Texture—silty clay loam or silt loam

2Bt horizon (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 2 to 6
Texture—silt loam, loam, or clay loam

2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—loam, clay loam, or sandy loam or their gravelly analogues; strata of silt loam occur in some pedons

2C horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—loam or sandy loam or their gravelly analogues; pockets or strata of silt loam, clay loam, or loamy sand occur in some pedons

Thackery Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Loamy material and the underlying calcareous outwash
Landform: Stream terraces
Position on the landform: Treads
Slope range: 0 to 6 percent
Adjacent soils: Eldean, Ockley, and Westland
Taxonomic class: Fine-loamy, mixed, active, mesic Aquic Hapludalfs

Typical Pedon

Thackery silt loam, 0 to 2 percent slopes; about 2.5 miles west-northwest of Morningsun, in Israel Township, Preble County, Ohio; about 620 feet west and 152 feet north of the southeast corner of sec. 17, T. 6 N., R. 1 E.

Ap1—0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary.

Ap2—5 to 12 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium and coarse subangular blocky structure; friable; common fine roots; moderately acid; abrupt smooth boundary.

Bt1—12 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; many distinct brown (10YR 4/3) clay films on faces of peds; 2 percent gravel; slightly acid; clear smooth boundary.

2Bt2—21 to 26 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; common fine roots; many distinct dark grayish brown (10YR 4/2) and few distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 3 percent gravel; neutral; clear smooth boundary.

2Bt3—26 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; moderate coarse subangular blocky structure; firm; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; common fine distinct dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; common fine and medium distinct black (10YR 2/1) masses of manganese accumulation throughout; 7 percent gravel; neutral; clear wavy boundary.

2Bt4—38 to 44 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine distinct dark yellowish brown (10YR 4/6) and

common fine and medium prominent yellowish brown (10YR 5/8) masses of iron accumulation throughout; common fine and medium distinct white (10YR 8/1) masses of calcium carbonate accumulation throughout; 10 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2BC—44 to 54 inches; brown (10YR 5/3) sandy clay loam; weak medium and coarse subangular blocky structure; friable; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; few fine and medium faint dark yellowish brown (10YR 4/4) and common fine and medium distinct dark yellowish brown (10YR 4/6) masses of iron accumulation throughout; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent gravel; slightly effervescent; slightly alkaline; gradual smooth boundary.

2C1—54 to 63 inches; brown (10YR 5/3) gravelly loamy coarse sand; single grain; loose; 20 percent gravel; strongly effervescent; moderately alkaline; gradual wavy boundary.

2C2—63 to 80 inches; brown (10YR 5/3) very gravelly loamy coarse sand; single grain; loose; 50 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 35 to 70 inches
Depth to carbonates: 32 to 55 inches
Thickness of the loamy mantle: 0 to 25 inches
Content of rock fragments: 0 to 2 percent in Ap and Bt horizons; 2 to 25 percent in 2Bt horizon; 10 to 70 percent in 2BC horizon; 15 to 70 percent in 2C horizon

Ap horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 2 or 3
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—silt loam or silty clay loam

2Bt or 2Btg horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 6
Texture—clay loam, loam, or sandy clay loam or their gravelly analogues

2BC or 2BCg horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 4
Texture—loam, sandy clay loam, or sandy loam or their gravelly to extremely gravelly analogues

2C horizon:
Color—hue of 10YR, value of 5, and chroma of 3
Texture—gravelly to extremely gravelly analogues of loamy sand or loamy coarse sand

The Thackery soils in map unit ThB are considered taxadjuncts to the Thackery series because they have redoximorphic features at a depth greater than what is defined in the range for the series. These soils classify as fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs. This difference, however, does not significantly affect use and management.

Warsaw Series

Depth class: Very deep
Drainage class: Well drained

Parent material: Loamy material and the underlying gravelly outwash
Landform: Wisconsinan outwash terraces
Position on the landform: Treads
Slope range: 0 to 2 percent
Adjacent soils: Eldean, Fox, Ockley, and Thackery
Taxonomic class: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Warsaw loam, 0 to 2 percent slopes; about 1 mile south of West Alexandria, in Lanier Township, Preble County, Ohio; about 1,798 feet north and 400 feet east of the northeast corner of sec. 10, T. 9 N., R. 2 E.

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; weak medium and fine granular structure; friable; common fine and very fine roots; common faint very dark gray (10YR 3/1) organic coatings throughout; 5 percent gravel; slightly acid; abrupt smooth boundary.

Bt1—12 to 21 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; common faint brown (7.5YR 4/4) clay films on faces of peds; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; 5 percent gravel; moderately acid; clear wavy boundary.

2Bt2—21 to 30 inches; brown (7.5YR 4/4) gravelly clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; few prominent very dark gray (10YR 3/1) organic coatings on faces of peds; 15 percent gravel; neutral; clear wavy boundary.

2C1—30 to 42 inches; brown (10YR 5/3) gravelly coarse sand; single grain; loose; 15 percent gravel; slightly effervescent; slightly alkaline; clear wavy boundary.

2C2—42 to 80 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand; single grain; loose; 70 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 24 to 40 inches
Thickness of the mollic epipedon: 10 to 22 inches
Depth to carbonates: 20 to 36 inches
Content of rock fragments: 0 to 14 percent in Ap horizon; 0 to 14 percent in Bt horizon; 15 to 25 percent in 2Bt horizon; 15 to 78 percent in 2C horizon

Ap horizon:
Color—hue of 7.5YR or 10YR, value of 2, 2.5, or 3, and chroma of 1 to 3
Texture—loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4
Texture—silty clay loam, loam, or clay loam

2Bt horizon:
Color—hue of 7.5YR or 10YR and value and chroma of 2 to 4
Texture—gravelly clay loam or gravelly sandy clay loam

2C horizon:
Color—hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 2 to 4
Texture—gravelly to extremely gravelly analogues of coarse sand, sand, loamy sand, or loamy coarse sand; horizon is commonly stratified

Figure 25.—Profile of a Westland soil. The scale is in inches.

Westland Series

Depth class: Very deep
Drainage class: Very poorly drained
Parent material: Loamy material over calcareous, stratified gravelly and sandy outwash
Landform: Depressions on the Wisconsinan outwash terraces
Position on the landform: Treads
Slope range: 0 to 2 percent
Adjacent soils: Thackery, Ockley, and Sloan
Taxonomic class: Fine-loamy, mixed, superactive, mesic Typic Argiaquolls (fig. 25)

Typical Pedon

Westland silt loam, 0 to 2 percent slopes; about 1.5 miles southeast of New Westville, in Jackson Township, Preble County, Ohio; about 590 feet north and 1,500 feet west of the southeast corner of sec. 4, T. 8 N., R. 1 E.

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium granular structure; friable; few fine roots; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; abrupt smooth boundary.

Btg1—12 to 20 inches; dark gray (10YR 4/1) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark gray

(10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; many medium faint dark grayish brown (10YR 4/2) iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; 2 percent gravel; neutral; gradual wavy boundary.

Btg2—20 to 28 inches; gray (10YR 5/1) clay loam; moderate medium subangular blocky structure; firm; few very fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; many medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 10 percent gravel; neutral; clear wavy boundary.

2Btg3—28 to 37 inches; grayish brown (2.5Y 5/2) gravelly clay loam; moderate medium subangular blocky structure; firm; many prominent dark gray (10YR 4/1) clay films on faces of peds; many medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine prominent black (10YR 2/1) masses of manganese accumulation throughout; common distinct light gray (10YR 7/2) masses of secondary carbonates throughout; 15 percent gravel; slightly effervescent around weathered limestone gravel; neutral; clear wavy boundary.

2Btg4—37 to 43 inches; dark gray (10YR 4/1) gravelly clay loam; moderate medium and fine subangular blocky structure; firm; many faint dark gray (10YR 4/1) clay films on faces of peds; many medium faint grayish brown (2.5Y 5/2) iron depletions in the matrix; common medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation throughout; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; few fine faint black (10YR 2/1) masses of manganese accumulation throughout; common distinct light gray (10YR 7/2) masses of secondary carbonates throughout; 15 percent gravel; slightly effervescent around weathered limestone gravel; neutral; clear wavy boundary.

2BCg—43 to 51 inches; grayish brown (10YR 5/2) gravelly sandy loam; weak coarse subangular blocky structure; friable; many medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; 20 percent gravel; slightly effervescent; slightly alkaline; abrupt smooth boundary.

2C—51 to 80 inches; brown (10YR 5/3) extremely gravelly loamy coarse sand; single grain; loose; 65 percent gravel; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Thickness of the mollic epipedon: 10 to 20 inches
Depth to carbonates: 40 to 60 inches
Content of rock fragments: 0 to 5 percent in Ap horizon; 0 to 5 percent in the upper part of Btg horizon; 1 to 15 percent in the lower part of Btg horizon; 5 to 40 percent in 2Btg and 2BC horizons; 20 to 65 percent in 2C or 2Cg horizon

Ap horizon:
Color—horizon has hue of 10YR or 2.5Y or is neutral in hue, has value of 2, 2.5, or 3, and has chroma of 0 to 3
Texture—silt loam

Btg horizon:
Color—horizon has hue of 10YR or 2.5Y or is neutral in hue, has value of 3 to 6, and has chroma of 0 to 2
Texture—loam, clay loam, or silty clay loam in the upper part of horizon and loam, clay loam, or sandy clay loam or their gravelly analogues in the lower part

2Btg horizon:
Color—horizon has hue of 10YR to 5Y or is neutral in hue, has value of 3 to 6, and has chroma of 0 to 2
Texture—loam, clay loam, sandy loam, or sandy clay loam or their gravelly or very gravelly analogues

2BCg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 0 to 2
Texture—loam, clay loam, sandy loam, or sandy clay loam or their gravelly or very gravelly analogues

2C or 2Cg horizon:
Color—horizon has hue of 10YR or 2.5Y or is neutral in hue, has value of 3 to 7, and has chroma of 0 to 4
Texture—gravelly to extremely gravelly analogues of coarse sand or loamy coarse sand; horizon commonly is stratified

Wynn Series

Depth class: Moderately deep
Drainage class: Well drained
Parent material: A thin layer of loess and the underlying till over limestone and shale
Landform: Wisconsinan till plains
Position on the landform: Summits, shoulders, footslopes, and backslopes
Slope range: 2 to 50 percent
Adjacent soils: Dana, Plattville, Russell, and Xenia
Taxonomic class: Fine, mixed, superactive, mesic Typic Hapludalfs

Typical Pedon

Wynn silt loam, 2 to 6 percent slopes, eroded; about 2.5 miles southeast of Morningsun, in Somers Township, Preble County, Ohio; about 1,700 feet west and 1,375 feet south of the northeast corner of sec. 31, T. 6 N., R. 2 E.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine and medium subangular blocky structure; friable; many fine and very fine and few medium roots; many distinct dark grayish brown (10YR 4/2) organic coatings on faces of peds; neutral; abrupt smooth boundary.

Bt1—8 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine and medium subangular blocky structure; friable; common fine and very fine and few medium roots; many distinct brown (10YR 4/3) clay films on faces of peds; common distinct dark grayish brown (10YR 4/2) organic coatings in root channels and pores; common faint brown (10YR 5/3) clay depletions on faces of peds; few fine distinct black (10YR 2/1) masses of manganese accumulation in the matrix; slightly acid; clear wavy boundary.

Bt2—15 to 23 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few fine and very fine roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common faint brown (10YR 5/3) clay depletions on faces of peds; few fine prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; common fine distinct black

(10YR 2/1) masses of manganese accumulation in the matrix; slightly acid; clear wavy boundary.

2Bt3—23 to 28 inches; brown (7.5YR 4/4) silty clay loam; moderate medium and coarse subangular blocky structure; firm; few fine and very fine roots; many distinct dark reddish brown (5YR 3/2) clay films on faces of peds; common fine prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common fine and medium prominent black (10YR 2/1) masses of manganese accumulation in the matrix; 2 percent limestone, igneous, and shale fragments; neutral; clear wavy boundary.

3Cr—28 to 30 inches; interbedded calcareous clay shale and limestone bedrock.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Thickness of the loess mantle: Typically, 10 to 23 inches; some eroded pedons do not have a mantle
Content of rock fragments: 0 percent in Ap and Bt horizons; 2 to 14 percent in 2Bt or 2BC horizon

Ap horizon:
Color—hue of 10YR, value of 4, and chroma of 2 or 3
Texture—silt loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 or 4
Texture—silty clay loam

2Bt or 2BC horizon:
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6
Texture—silty clay loam, clay loam, clay, or silty clay

3Cr horizon:
Bedrock—interbedded calcareous clay shale and limestone

Xenia Series

Depth class: Very deep
Drainage class: Moderately well drained
Parent material: Typically, loess and the underlying till; in the bedrock substratum phase, loess and the underlying till over limestone and shale
Landform: Flats and slight rises on the Wisconsinan till plains and ground moraines
Position on the landform: Summits and shoulders
Slope range: 0 to 6 percent
Adjacent soils: Cyclone, Fincastle, Morningsun, Sugarvalley, and Russell
Taxonomic class: Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Typical Pedon

Xenia silt loam, 0 to 2 percent slopes; about 11.4 miles west and 7.6 miles south of Eaton, in Dixon Township, Preble County, Ohio; about 500 feet south and 500 feet east of the northwest corner of sec. 19, T. 6 N., R. 1 E.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate medium granular structure; friable; common fine roots; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; moderately acid; abrupt smooth boundary.

Bt1—9 to 14 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine

subangular blocky structure; friable; common fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few distinct brown (10YR 5/3) clay depletions on faces of peds; few fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; strongly acid; clear smooth boundary.

Bt2—14 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common distinct pale brown (10YR 6/3) clay depletions on faces of peds; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; clear wavy boundary.

Bt3—26 to 38 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct yellowish brown (10YR 5/6) clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine distinct black (10YR 2/1) masses of manganese accumulation throughout; very strongly acid; clear wavy boundary.

2BC—38 to 48 inches; yellowish brown (10YR 5/4) clay loam; weak coarse subangular blocky structure; firm; few distinct yellowish brown (10YR 5/6) clay films on faces of peds; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 3 percent limestone and 2 percent igneous fragments; slightly effervescent; slightly alkaline; clear wavy boundary.

2Cd—48 to 80 inches; yellowish brown (10YR 5/4) loam that has thin strata of silt loam; massive; firm; common medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine distinct black (10YR 2/1) masses of manganese accumulation throughout; 5 percent limestone and 5 percent igneous fragments; strongly effervescent; moderately alkaline.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to carbonates: 35 to 60 inches
Depth to bedrock: Typically, more than 80 inches; in the bedrock substratum phase, ranging from 60 to 80 inches
Thickness of the loess mantle: 22 to 40 inches
Content of rock fragments: 0 to 1 percent in Ap and Bt horizons; 2 to 10 percent in 2Bt, 2BC, and 2Cd horizons

Ap horizon:
Color—hue of 10YR, value of 4, and chroma of 2 or 3
Texture—silt loam

Bt horizon:
Color—hue of 10YR, value of 4 to 6, and chroma of 3 to 6
Texture—silt loam or silty clay loam

2Bt horizon (if it occurs):
Color—hue of 10YR, value of 4 or 5, and chroma of 3 to 6
Texture—clay loam or loam

2BC horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 or 4
Texture—clay loam or loam

2Cd horizon:
Color—hue of 10YR, value of 5, and chroma of 3 or 4
Texture—loam; some pedons have strata or pockets of silt loam in the upper part; in the bedrock substratum phase, horizon is loam or flaggy loam

3Cr horizon (in the bedrock substratum phase):
Bedrock—weathered shale and limestone

Formation of the Soils

This section relates the factors of soil formation to the soils in Preble County. It also explains the processes of soil formation.

Factors of Soil Formation

A soil is a three-dimensional natural body consisting of mineral and organic material that can support plant growth. The nature of any soil at a given site is the result of the interaction of five general factors—parent material, climate, plants and animals, relief, and time *(17)*. Climate and plants and animals have an effect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among the soils are caused by variations in one or more of the soil-forming factors.

Parent Material

Parent material is the raw material acted upon by the other soil-forming factors. It largely determines soil texture, which in turn affects other properties, such as natural soil drainage and permeability. The physical and chemical composition of parent material has an important effect on the kind of soil that forms.

The soils in Preble County formed in many different kinds of parent material. Many of the soils formed in material deposited by the glaciers that covered much of the survey area thousands of years ago or by the meltwater from these glaciers. Other soils formed in loess, which is silty windblown material, or in alluvium, which is material recently deposited by streams.

Till is material that was deposited directly by glacial ice with little or no water action. It typically has particles that vary in size, including sand, silt, and clay and some pebbles, cobblestones, and larger rock fragments. The smaller rock fragments generally are angular. The composition of the till depends on the nature of the area over which the ice passed before the till was deposited. Some of the material was transported great distances by the ice, but most of the till is of local origin. Most of the till in Preble County was deposited during the last major glaciation, the Wisconsinan Glaciation. This till is massive and compact and generally is loam.

The till plains in Preble County are ground moraines, kames, and end moraines. The ground moraines are typically broad landforms that are nearly level and gently sloping. The kames and end moraines are more pronounced features on the landscape and range from nearly level to steep. Celina, Crosby, Fincastle, Kendallville, Losantville, Miami, Miamian, and Xenia soils are examples of soils on till plains that formed in till.

Outwash deposits, which were laid down by moving water, and lacustrine deposits, which were laid down in still water, are two general kinds of meltwater deposits. The size of the particles that can be carried suspended in water depends on the speed of the moving water. When the water slows to a given speed, the suspended particles that are larger than a given size settle in the water. Water slows wherever a stream loses grade or flows into a body of still water. At that point, the coarser sand and gravel

particles settle near the mouth of the stream and the silt and fine clay particles are carried farther into the lake, where they slowly settle.

The soils that formed in outwash deposits are of minimum extent in Preble County. They formed in deposits laid down as surging meltwater poured from the glacier, depositing sand and gravel as outwash terraces, outwash plains, and kames. The meltwater washed away the smaller particles of silt and clay, leaving behind sand and gravel. The soils that formed in outwash generally are permeable. Outwash of Wisconsinan age is deposited in the county.

The amount of natural lime and the proportion of shale, sandstone, limestone, and igneous pebbles in the outwash are determined by the source of the outwash. The Wisconsinan outwash deposits along the major terraces in Preble County were derived from limestone-influenced glacial drift. Eldean and Ockley soils formed in limy outwash of Wisconsinan age. The outwash deposits generally have a mantle of loess. The thickness of the loess on the outwash terraces varies inversely with the slope.

Soils that formed in lacustrine deposits are of relatively minor extent throughout the county, although they are locally extensive in places. They formed in deposits laid down in scattered old glacial or post-glacial lakes. Milford soils formed in these silty deposits.

Loess is wind-deposited, silty soil material. Soils that formed in loess are of major extent in Preble County, although they mainly occur in the western and southern parts *(15)*. The loess was deposited as the outwash terraces were forming. Strong winds swept across these open, level terraces, picked up silt particles, and later deposited the particles, commonly on landforms at higher elevations. Morningsun and Sugarvalley soils formed mainly in loess that was deposited on Wisconsinan ground moraines.

The southern part of the county was glaciated; however, the glacier had less of an influence on soil morphology, especially on the steeper slopes. In areas on the Richmond Formation, Wynn soils formed in a thin layer of loess and the underlying till over limestone and shale.

Recent alluvium is soil material deposited by floodwater along streams. The texture of the soil material varies, depending on the speed of the floodwater, the duration of flooding, and the distance from the streambank. Soils that formed in recent alluvium can be highly stratified. The soil horizons are weakly expressed because the soil-forming processes are interrupted with each new deposition. The source of the alluvium generally is material eroded from other soils farther upstream in the watershed. Eel, Sloan, and Stonelick soils formed in slightly acid to calcareous, recent alluvium derived from soils that formed in limy Wisconsinan till and outwash.

Climate

The climate in Preble County has significantly affected the soil-forming processes. Climatic factors, such as precipitation and temperature, have influenced the existing plant and animal communities and the physical and chemical weathering of the parent material.

During the colder glacial epoch, the advancing glaciers spread over the survey area and buried the boreal forest and the underlying soils. The cold temperatures in the soil reduced the rate of chemical reactions in the existing soils and in the raw parent material. Increased frost action, resulting from a periglacial climate, caused frost churning in some soils. Strong winds swept across the recently deposited glacial parent material, which was largely devoid of vegetation, and carried away large amounts of silt-sized particles, which were later deposited as loess. When the glacial ice retreated and the climate gradually warmed, deciduous forests eventually succeeded the boreal vegetation.

The county currently has a humid, temperate climate, which has persisted for

thousands of years. In this climatic environment, physical and chemical weathering of the parent material can occur along with the accumulation of organic matter, the decomposition of minerals, the formation and translocation of clay, the leaching of soluble compounds, and alternating periods of freezing and thawing.

The microclimate in a given area can affect soil formation. Cyclone and Kokomo soils, which are in depressional or low-lying areas, receive runoff from the higher adjacent slopes. The runoff creates a wet microclimate that results in prolonged saturation, the reduction of iron, and a gray subsoil. Sloping soils, such as Miamian soils, formed under a drier microclimate because of runoff. The better external drainage results in better aeration, the oxidation of iron, and a yellowish brown subsoil. Aspect also affects the microclimate through its effect on the amount of sunlight and heat energy reaching the soil, the trees that grow on the soil, and the accumulation of organic matter in the soil.

Plants and Animals

The vegetation under which a soil forms influences such soil properties as soil color, structure, reaction, and content and distribution of organic matter. Vegetation extracts water from the soil, recycles nutrients, and adds organic matter to the soil. Gases derived from root respiration combine with water to form acids that influence the weathering of minerals. Because of a lower content of organic matter, soils that formed under forest vegetation are generally lighter colored than those that formed under grasses.

At the time the survey area was settled, the native vegetation consisted mainly of hardwood forests. Red oak, white oak, sugar maple, and American beech commonly grew on the better drained soils on the Wisconsinan till plains. Pin oak, shagbark hickory, red maple, American elm, and white ash were common on the wetter soils on these till plains. Water-tolerant reeds and sedges, willow, tamarack, and alder grew in scattered small fens or marshes.

Bacteria, fungi, and many other micro-organisms decompose organic matter and release nutrients to growing plants. They influence the formation of peds. Soil properties, such as drainage, temperature, and reaction, influence the type of micro-organisms that live in the soil. Fungi are generally more active in the more acid soils, while bacteria are more active in the less acid soils.

Earthworms, insects, and small burrowing animals mix the soil and create small channels that influence soil aeration and the percolation of water. Earthworms help to incorporate crop residue or other organic matter into the soil. The organic material improves tilth. In areas that are well populated with earthworms, the leaf litter that accumulates on the soil in the fall is generally incorporated into the soil by the following spring. If the earthworm population is low, part of the leaf fall can remain on the surface of the soil for several years.

Human activities have significantly influenced soil formation. Native forests have been cleared and the cleared areas developed for farming and other uses. Cultivation has accelerated erosion on sloping soils; wet soils have been drained; and manure, lime, chemical fertilizers, and pesticides have been applied in cultivated areas. Cultivation has affected soil structure and compaction and lowered the content of organic matter. The development of land for urban uses or for mining has significantly influenced the soils in some areas.

Relief

Relief influences soil formation mainly through its effect on runoff and erosion. To a lesser extent, it also influences soil temperature, the plant cover, depth to the water table, and the accumulation and removal of organic matter.

Because it causes differences in external soil drainage, relief can differentiate soils that formed in the same kind of parent material. Water that runs off the more sloping soils can collect in depressions or swales. Kokomo and Miamian soils both formed in loamy till. The gently sloping to very steep Miamian soils on knolls and side slopes are well drained. They are in areas where external drainage is good. The nearly level Kokomo soils are very poorly drained. They are in swales or depressions that receive runoff from the higher adjacent soils, such as Miamian soils.

Relief varies very little in Preble County. On the ground moraines, the soils generally are nearly level and gently sloping. Relief becomes more pronounced and dissected on the end moraines and near the Four Mile Creek, Seven Mile Creek, Whitewater River, and Twin Creek watersheds.

Time

The length of time that the parent material has been exposed to the soil-forming processes influences the nature of the soil that forms. The youngest soils in Preble County, such as Eel, Medway, Sloan, and Stonelick soils, formed in recent alluvium. These soils may be stratified and have weakly expressed horizons because the soil-forming processes are interrupted with each new deposition of material.

Glaciers advanced over all of the survey area during the Wisconsinan Glaciation. Glacial deposits of Wisconsinan age are geologically young, yet enough time has elapsed for the initially raw parent material to weather into soils that have distinct horizons. In most of the soils, including Celina, Crosby, and Miamian soils, carbonates have been leached to a depth of about 2 to 3 feet, clay has been translocated from the A horizon to the B horizon, and organic matter has accumulated in the A horizon.

Processes of Soil Formation

Soil forms through complex processes that are grouped into four general categories—additions, removals, transfers, and transformations. These processes affect soil formation, although in differing degrees.

The accumulation of organic matter in the A horizon of the mineral soils in Preble County is an example of an addition. This accumulation is the main reason for the dark color of the A horizon. The color of the raw parent material remains uniform as depth increases.

The leaching of lime from the upper 2 to 3 feet in many of the soils in Preble County that formed in till is an example of a removal. The parent material of these soils was initially limy, but the lime has been leached from the upper part of the profile by percolating water.

The translocation of clay from the A horizon to the B horizon in many soils on uplands in the county is an example of a transfer. An A or E horizon is a zone of eluviation, or loss. A B horizon is a zone of illuviation, or gain. In Celina, Miamian, and other soils, the B horizon has more clay than the parent material and the A horizon has less clay. In the B horizon of some soils, thin clay films are in pores and on faces of peds. This clay has been transferred from the A horizon.

An example of a transformation is the reduction and solubilization of ferrous iron. This process takes place under wet, saturated conditions in which there is no molecular oxygen. Gleying, or the reduction of iron, is evident in Cyclone, Kokomo, and Lippincott soils, which have a dominantly gray subsoil. The gray color indicates the presence of reduced ferrous iron, which in turn implies wetness. Reduced iron is soluble, but it commonly has been moved short distances in the soils in Preble County, stopping either in the horizon where it originated or in an underlying horizon. Part of this iron can be reoxidized and segregated in the form of stains, concretions, or bright yellow and red mottles.

References

(1) Allan, P.F., L.E. Garland, and R. Dugan. 1963. Rating northeastern soils for their suitability for wildlife habitat. *In* Transactions of the 28th North American Wildlife and Natural Resources Conference, pp. 247-261.

(2) American Association of State Highway and Transportation Officials (AASHTO). 2000. Standard specifications for transportation materials and methods of sampling and testing. 20th ed., 2 vols.

(3) American Society for Testing and Materials (ASTM). 2001. Standard classification of soils for engineering purposes. ASTM Standard D 2487-00.

(4) Barnet, John W. 1962. Regional silviculture of United States.

(5) Boyne, David H. 1979. Ohio farm income. Ohio Agric. Res. and Dev. Center, Dep. Ser. E. S. O. 757.

(6) Braun, E. Lucy. 1950. Deciduous forests of eastern North America.

(7) Carmean, Willard H., and Burl S. Ashley. 1972. How to judge black oak site quality. U.S. Dep. Agric., Forest Serv. North Central Forest Exp. Stn.

(8) Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildl. Serv. FWS/OBS-79/31.

(9) Dennis, Donald F., and Thomas W. Birch. 1981. Forest statistics for Ohio, 1979. U.S. Dep. Agric., Forest Serv. Bull. NE-68.

(10) Eyre, F.H., ed. 1980. Forest cover types of the United States and Canada. Soc. of Am. Forestry.

(11) Federal Register. July 13, 1994. Changes in hydric soils of the United States.

(12) Federal Register. February 24, 1995. Hydric soils of the United States.

(13) Goldthwait, Richard P., George W. White, and Jane L. Forsyth. 1961. Glacial map of Ohio. Map I–316. U.S. Geol. Surv., Misc. Geol. Inventory.

(14) H.Z. Williams & Brother, Publisher. 1881. History of Preble County.

(15) Hock, A.G., L.P. Wilding, and G.F. Hall. 1973. Loess distribution on a Wisconsin age till plain in southwestern Ohio. Soil Sci. Soc. of America Proceedings, Vol. 37 No. 5.

(16) Hurt, G.W., P.M. Whited, and R.F. Pringle, eds. 1998. Field indicators of hydric soils in the United States. Ver. 4.0.

(17) Jenny, Hans. 1941. Factors of soil formation.

(18) National Research Council. 1995. Wetlands: Characteristics and boundaries.

(19) Ohio Cooperative Extension Service. 1995. Ohio agronomy guide. Ohio State Univ., Bull. 472, Agdex 112.

(20) Ohio Department of Development. 2004. Profile of Preble County.

(21) Ramey, Matthews, Brown, and Delong. 1993. Ohio agricultural statistics—1992.

(22) Ruhe, R.V. 1975. Geomorphology: Geomorphic processes and surficial geology.

(23) Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson, eds. 2002. Field book for describing and sampling soils. U.S. Dep. Agric., Natural Resourc. Conserv. Serv., National Soil Surv. Center, Lincoln, NE. Ver. 2.0.

(24) Stout, Wilber. 1941. Dolomites and limestones of western Ohio. Geol. Surv. of Ohio, Columbus, Ser. 4, Bull. 42.

(25) Stout, Wilber, Karl Versteeg, and G.F. Lamb. 1943 (reprinted 1968). Geology of waters in Ohio. Geol. Surv. of Ohio, Columbus, Ser. 4, Bull. 44.

(26) Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildl. Serv. and Del. Dep. Natural Resourc. and Environ. Control, Wetlands Sec.

(27) United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Exp. Stn. Tech. Rep. Y-87-1.

(28) United States Department of Agriculture. 1969. Soil survey of Preble County, Ohio.

(29) United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. (Available at http://nsscnt.nssc.nrcs.usda.gov/nfm/)

(30) United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (Available at http://www.statlab.iastate.edu/soils/nssh/)

(31) United States Department of Agriculture, Natural Resources Conservation Service. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. U.S. Dep. Agric. Handb. 436, 2nd ed.

(32) United States Department of Agriculture, Natural Resources Conservation Service. 2003. Keys to soil taxonomy. Soil Surv. Staff, 9th ed.

(33) United States Department of Agriculture, Soil and Water Conservation Needs Committee. 1971. Ohio soil and water conservation needs inventory.

(34) United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.

(35) United States Department of Agriculture, Soil Conservation Service. 1987. Basic statistics, 1982 national resources inventory. Stat. Bull. 756.

(36) United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual. Soil Surv. Staff. U.S. Dep. Agric. Handb. 18.

(37) United States Department of Commerce, Bureau of the Census. Census of population, 2000.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.
Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.
AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.
Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.
Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.
Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.
Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.
Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.
Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.
Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.
Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.
Aspect. The direction in which a slope faces.
Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.
Backswamp. A flood plain landform. An extensive, marshy or swampy, depressed area of flood plains between natural levees and valley sides or terraces.
Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.
Basal till. Compact till deposited beneath the ice.
Base saturation. The degree to which material having cation-exchange properties is

saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Beach ridge. A low, essentially continuous mound of beach or beach and dune material heaped up by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves, and occurring singly or as one of a series of approximately parallel deposits. These ridges define the limits of relict lakes.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Beta horizon. A special type of lower Bt horizon with a significant accumulation of translocated silicate clay between two contrasting parent materials.

Borrow pit. An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically less than 2 acres in size. Larger areas are mapped as Udorthents.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Bulk density. The mass of a dry soil per unit bulk volume. The bulk volume is determined before drying to a constant weight at 105 degrees C. The value is expressed in grams per cubic centimeter.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between

particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clayey. Containing more than 35 percent clay.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and is without a natural outlet for surface drainage.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Compaction. Any process by which the mineral grains of soil are rearranged to decrease void space and bring them into closer contact with one another, thereby increasing the weight of solid material per cubic foot. In agronomy, usually associated with machinery traffic across the soil during farming operations.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them

separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse-grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour. An imaginary line on the surface of the earth connecting points of the same elevation.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropland. Land used primarily for the production of adapted cultivated, close-growing crops, fruit, or nut crops for harvest, alone or in association with sod crops.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase

per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense material. A very firm, massive, noncemented, root-restrictive layer (commonly till) that has no cracks or in which the spacing of cracks that roots can enter is 10 centimeters or more. The materials within the survey area have a bulk density of more than 1.8 grams per cubic centimeter.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep soils, 20 to 40 inches; shallow soils, 10 to 20 inches; and very shallow soils, less than 10 inches.

Depth to bedrock (in tables). Bedrock is too near the surface for the specified use.

Depth to dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Dolostone. A term used for the sedimentary rock dolomite in order to avoid confusion with the mineral of the same name. A carbonate sedimentary rock consisting mostly (more than 50 percent by weight) of the mineral dolomite [$CaMg(CO_3)_2$].

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen

plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Effervescence. The gaseous response (observed as bubbles) of soil to applied hydrochloric acid (HCl) or other chemicals. A field or laboratory test to determine the presence of carbonates in the soil.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

End moraine. A moraine produced at the front of an actively flowing glacier at any given time.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff, generally produced by erosion or faulting, breaking the general continuity of more gently sloping land surfaces. Exposed nonbedrock material is nonsoil material or very shallow, poorly developed soil. Typically 0.1 acre to 2 acres in size. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Filtering capacity (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The geomorphic component that forms the inner, gently inclined surface at the base of a hillslope. The surface profile is dominantly concave. In terms of gradational processes, the footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit. An open excavation from which soil and the loose underlying material have been removed and used as a source of sand or gravel, usually for construction purposes.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area in which the surface layer has more than 35 percent, by

volume, rock fragments (mostly less than 3 inches in diameter) in an area of surrounding soil that has less than 15 percent rock fragments.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground moraine. An extensive, fairly even layer of till that has an uneven, undulating surface; a deposit of rock and mineral debris dragged along, in, on, and beneath a glacier and emplaced by processes including basal lodgment and release from downwasting stagnant ice by ablation.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim (in tables). Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides,

humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landfill. An area where waste products of human habitation are disposed. These products can be above or below natural ground level.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Limestone. A sedimentary rock composed of calcium carbonate. There are many impure varieties.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Lithic contact. A boundary between soil and continuous, coherent underlying material. The underlying material must be sufficiently coherent to make hand digging with a spade impractical.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine-grained material, dominantly of silt-sized particles, deposited by wind.

Longshore bar. A narrow, elongate, coarse textured ridge that once rose near to, or barely above, a pluvial or glacial lake and extended generally parallel to the shore but was separated from it by an intervening trough or lagoon; both the bar and lagoon are now relict features.

Low strength. The soil is not strong enough to support loads.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Marsh. A water-saturated, very poorly drained area, intermittently or permanently covered by water. Marsh areas dominantly support sedges, cattails, and rushes. The term is not used in map units where poorly drained or very poorly drained soils are the named components. Areas indicated on the maps typically are 0.5 acre to 2 acres in size.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Mulch. Any material, such as straw, sawdust, leaves, plastic film, or loose soil, that is spread upon the surface of the soil to protect the soil and plant roots from the effects of raindrops, soil crusting, freezing, and evaporation.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

No-till farming. A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth, which typically involves opening a small slit or punching a hole into the soil. There is usually no cultivation during crop production. Chemical weed control is normally used.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Paralithic contact. Similar to a lithic contact, except that the underlying material is softer and can be dug with difficulty with a spade.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Pebbles. Rounded or partially rounded rock or mineral fragments between 2 and 75 millimeters in diameter.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to

100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Perennial water. A natural or manmade lake, pool, pit, or stream course that contains water for most of the year.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperature below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse-grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Quarry. An open excavation from which bedrock has been removed.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Restricted permeability (in tables). The slow movement of water through the soil adversely affects the specified use.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rise. A geomorphic component of flat plains (e.g., lake plain, low coastal plain, low-gradient till plain) consisting of a slightly elevated but low, broad area with slow slope gradients (i.e., slopes of 1 to 3 percent); typically a microfeature but can be fairly extensive. Commonly, soils on a rise are better drained than those in the surrounding flat area.

Riser. The sloping surface of a series of natural steplike landforms, as those of successive stream terraces.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. Exposures of base bedrock, typically hard rock, at the surface of the earth.
Root zone. The part of the soil that can be penetrated by plant roots.
Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.
Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.
Sandstone. Sedimentary rock containing dominantly sand-sized particles.
Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.
Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.
Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.
Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.
Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.
Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.
Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)
Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.
Shale. Sedimentary rock formed by the hardening of a clay deposit.
Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.
Short steep slope. A narrow area in which the soil has slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.
Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.
Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.
Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.
Silica. A combination of silicon and oxygen. The mineral form is called quartz.
Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.
Siltstone. Sedimentary rock made up of dominantly silt-sized particles.
Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Level	0 to 1 percent
Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Strongly sloping	6 to 12 percent
Moderately steep	12 to 25 percent
Steep	25 to 50 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on outwash, or on a glaciolacustrine deposit.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or

more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsidence. The loss in volume that occurs in muck soils when they oxidize or dry.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swamp. An area that is saturated with water throughout much of the year but in which the surface of the soil is generally not deeply submerged. Swamp areas dominantly support trees and shrubs.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.
Till. Unsorted, nonstratified drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.
Till plain. An extensive area of nearly level to undulating soils underlain by till.
Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.
Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.
Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
Tread. The flat or gently sloping surface of natural steplike landforms, commonly one of a series, such as successive stream terraces.
Typical pedon. The site of the pedon described as typical for the series in the survey area.
Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.
Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.
Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.
Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.
Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.
Water table. The upper surface of ground water, or the level below which the soil is saturated with water.
Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.
Well graded. Refers to soil material consisting of coarse-grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.
Wet spot. An area of soil that is somewhat poorly drained to very poorly drained and that is at least two drainage classes wetter than the named soils in the surrounding map unit.
Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.
Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1971-2000 at Eaton, Ohio)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temp. higher than--	2 years in 10 will have-- Minimum temp. lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snow-fall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January--	33.6	15.6	24.6	62	-18	2	2.57	1.41	3.60	6	3.4
February-	38.6	18.7	28.7	69	-10	2	2.30	1.12	3.33	5	2.8
March----	49.7	27.9	38.8	78	3	32	3.25	2.20	4.20	7	1.4
April----	61.3	36.8	49.1	84	19	98	4.03	2.50	5.41	8	0.4
May------	72.1	48.1	60.1	89	30	324	4.72	2.60	6.60	8	0.0
June-----	80.7	57.1	68.9	94	40	558	3.86	2.28	5.27	6	0.0
July-----	84.6	61.0	72.8	97	45	697	3.74	1.98	5.27	6	0.0
August---	83.2	59.1	71.1	94	44	657	3.30	1.82	4.60	6	0.0
September	76.9	51.5	64.2	92	33	429	2.64	1.12	3.93	4	0.0
October--	64.7	39.4	52.1	84	21	141	2.74	1.50	3.84	5	0.0
November-	50.9	31.2	41.0	75	12	36	3.41	1.85	4.80	6	0.0
December-	38.7	21.7	30.2	65	-7	6	3.03	1.73	4.18	6	2.0
Yearly:											
Average	61.3	39.0	50.1	---	---	---	---	---	---	---	---
Extreme	102	-33	---	97	-20	---	---	---	---	---	---
Total--	---	---	---	---	---	2,983	39.58	34.31	44.16	73	10.0

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Eaton, Ohio)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 21	May 1	May 15
2 years in 10 later than--	Apr. 16	Apr. 26	May 9
5 years in 10 later than--	Apr. 6	Apr. 16	Apr. 29
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 11	Oct. 2	Sept. 23
2 years in 10 earlier than--	Oct. 18	Oct. 9	Sept. 29
5 years in 10 earlier than-	Oct. 30	Oct. 21	Oct. 9

Table 3.—Growing Season

(Recorded in the period 1971-2000 at Eaton, Ohio)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	177	160	141
8 years in 10	187	170	149
5 years in 10	207	188	164
2 years in 10	226	206	180
1 year in 10	236	216	188

Table 4.—Acreage and Proportionate Extent of the Map Units

Map symbol	Soil name	Acres	Percent
CeA	Celina silt loam, 0 to 2 percent slopes	5,375	2.0
CeB	Celina silt loam, 2 to 6 percent slopes	31,313	11.5
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded	12,937	4.7
CoA	Corwin silt loam, 0 to 2 percent slopes	352	0.1
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes	23,574	8.6
CtB	Crosby-Celina silt loams, 2 to 4 percent slopes	14,069	5.2
CvA	Crosby-Lewisburg silt loams, 0 to 2 percent slopes	1,446	0.5
CyA	Cyclone silt loam, 0 to 2 percent slopes	7,086	2.6
DaA	Dana silt loam, 0 to 2 percent slopes	297	0.1
DaB	Dana silt loam, 2 to 6 percent slopes	314	0.1
EeA	Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded	1,763	0.6
EgA	Eldean gravelly loam, 0 to 2 percent slopes	54	*
EgB	Eldean gravelly loam, 2 to 6 percent slopes	94	*
EgB2	Eldean gravelly loam, 2 to 6 percent slopes, eroded	79	*
EhC3	Eldean gravelly clay loam, 6 to 12 percent slopes, severely eroded	708	0.3
EhD3	Eldean gravelly clay loam, 12 to 18 percent slopes, severely eroded	139	*
EkA	Eldean loam, 0 to 2 percent slopes	1,731	0.6
EkB	Eldean loam, 2 to 6 percent slopes	1,411	0.5
EkB2	Eldean loam, 2 to 6 percent slopes, eroded	871	0.3
FcA	Fincastle silt loam, 0 to 2 percent slopes	2,161	0.8
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes	61	*
FmA	Fox silt loam, till substratum, 0 to 2 percent slopes	760	0.3
FmB	Fox silt loam, till substratum, 2 to 6 percent slopes	261	*
FmB2	Fox silt loam, till substratum, 2 to 6 percent slopes, eroded	117	*
HeF2	Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded	3,513	1.3
HwE2	Hennepin-Wynn silt loams, 18 to 25 percent slopes, eroded	291	0.1
HwF2	Hennepin-Wynn silt loams, 25 to 50 percent slopes, eroded	704	0.3
KeC2	Kendallville-Eldean silt loams, 6 to 12 percent slopes, eroded	1,574	0.6
KeD2	Kendallville-Eldean silt loams, 12 to 18 percent slopes, eroded	736	0.3
KnA	Kokomo silt loam, 0 to 1 percent slopes	20,236	7.4
KoA	Kokomo silty clay loam, 0 to 1 percent slopes	18,750	6.9
LeB	Lewisburg-Celina silt loams, 2 to 6 percent slopes	1,140	0.4
LfB2	Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded	749	0.3
LgC3	Lewisburg clay loam, 6 to 12 percent slopes, severely eroded	226	*
LpA	Lippincott silty clay loam, 0 to 2 percent slopes	419	0.2
MaA	Medway silt loam, 0 to 1 percent slopes, occasionally flooded	1,878	0.7
MbB2	Miami silt loam, 2 to 6 percent slopes, eroded	1,228	0.4
McE2	Miami-Kendallville silt loams, 18 to 25 percent slopes, eroded	279	0.1
McF2	Miami-Kendallville silt loams, 25 to 50 percent slopes, eroded	113	*
MdC2	Miami loam, 6 to 12 percent slopes, eroded	994	0.4
MdD2	Miami loam, 12 to 18 percent slopes, eroded	583	0.2
MeC	Miamian silt loam, 6 to 12 percent slopes	163	*
MeC2	Miamian silt loam, 6 to 12 percent slopes, eroded	16,165	5.9
MeD2	Miamian silt loam, 12 to 18 percent slopes, eroded	2,853	1.0
MfB	Miamian-Celina silt loams, 2 to 6 percent slopes	8,311	3.0
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded	18,395	6.7
MgE2	Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded	446	0.2
MgF2	Miamian-Kendallville silt loams, 25 to 50 percent slopes, eroded	1,138	0.4
MhC3	Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded	10,889	4.0
MhD3	Miamian-Losantville clay loams, 12 to 18 percent slopes, severely eroded	5,706	2.1
MmE2	Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded	2,896	1.1
MnE3	Miamian-Hennepin clay loams, 18 to 25 percent slopes, severely eroded	1,217	0.4
MpA	Milford silty clay loam, 0 to 2 percent slopes	45	*
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes	55	*
MsA	Millsdale silt loam, 0 to 2 percent slopes	150	*
MtA	Millsdale silty clay loam, 0 to 2 percent slopes	106	*
MuA	Milton silt loam, 0 to 2 percent slopes	203	*
MuB	Milton silt loam, 2 to 6 percent slopes	331	0.1
MuB2	Milton silt loam, 2 to 6 percent slopes, eroded	673	0.2

See footnote at end of table.

Table 4.—Acreage and Proportionate Extent of the Map Units—Continued

Map symbol	Soil name	Acres	Percent
MuC2	Milton silt loam, 6 to 12 percent slopes, eroded	444	0.2
MuD2	Milton silt loam, 12 to 18 percent slopes, eroded	200	*
MuE2	Milton silt loam, 18 to 25 percent slopes, eroded	107	*
MwA	Morningsun silt loam, 0 to 2 percent slopes	1,108	0.4
MxA	Morningsun-Xenia silt loams, 0 to 2 percent slopes	1,072	0.4
MxB	Morningsun-Xenia silt loams, 2 to 6 percent slopes	628	0.2
MxB2	Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded	167	*
MyA	Mahalasville silt loam, 0 to 2 percent slopes	159	*
OcA	Ockley silt loam, 0 to 2 percent slopes	896	0.3
OcB	Ockley silt loam, 2 to 6 percent slopes	647	0.2
Pg	Pits, gravel	314	0.1
Pq	Pits, quarry	55	*
PtB	Plattville silt loam, moderately wet, 2 to 6 percent slopes	162	*
RaA	Rainsville silt loam, 0 to 2 percent slopes	677	0.2
RaB	Rainsville silt loam, 2 to 6 percent slopes	1,220	0.4
RaB2	Rainsville silt loam, 2 to 6 percent slopes, eroded	1,336	0.5
RcA	Randolph silt loam, 0 to 2 percent slopes	187	*
RcB	Randolph silt loam, 2 to 6 percent slopes	138	*
RnE2	Rodman gravelly loam, 18 to 25 percent slopes, eroded	61	*
RnF2	Rodman gravelly loam, 25 to 50 percent slopes, eroded	25	*
RoE2	Rodman-Kendallville complex, 18 to 25 percent slopes, eroded	198	*
RoF2	Rodman-Kendallville complex, 25 to 50 percent slopes, eroded	365	0.1
RpA	Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded	5,295	1.9
RuB	Russell-Miamian silt loams, 2 to 6 percent slopes	2,315	0.8
RuB2	Russell-Miamian silt loams, 2 to 6 percent slopes, eroded	2,072	0.8
SeA	Savona silt loam, 0 to 2 percent slopes	84	*
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded	2,112	0.8
StA	Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded	4,019	1.5
SvA	Sugarvalley silt loam, 0 to 2 percent slopes	1,701	0.6
SwA	Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes	1,188	0.4
ThA	Thackery silt loam, 0 to 2 percent slopes	1,488	0.5
ThB	Thackery silt loam, 2 to 6 percent slopes	229	*
Ud	Udorthents	142	*
W	Water	1,559	0.6
WbA	Warsaw loam, 0 to 2 percent slopes	166	*
WnA	Westland silt loam, 0 to 2 percent slopes	3,387	1.2
WyB	Wynn silt loam, 2 to 6 percent slopes	408	0.1
WyB2	Wynn silt loam, 2 to 6 percent slopes, eroded	420	0.2
WyC2	Wynn silt loam, 6 to 12 percent slopes, eroded	1,109	0.4
WyD2	Wynn silt loam, 12 to 18 percent slopes, eroded	161	*
XeA	Xenia silt loam, 0 to 2 percent slopes	2,772	1.0
XeB	Xenia silt loam, 2 to 6 percent slopes	1,686	0.6
XeB2	Xenia silt loam, 2 to 6 percent slopes, eroded	220	*
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes	120	*
	Total	272,947	100.0

* Less than 0.1 percent.

Table 5.—Cropland Limitation Ratings

(The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Root-restrictive layer	0.09	Surface crusting	0.45
			Root-restrictive layer	0.09
CeB:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
	Root-restrictive layer	0.02	Erosion hazard	0.27
			Root-restrictive layer	0.02
CeB2:				
Celina	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Restricted permeability	1.00	Surface crusting	1.00
	Root-restrictive layer	0.69	Restricted permeability	1.00
	Susceptible to compaction	0.50	Root-restrictive layer	0.69
	Erosion hazard	0.27	Susceptible to compaction	0.50
	Tilth	0.25		0.50
			Erosion hazard	0.27
			Tilth	0.25
CoA:				
Corwin	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Root-restrictive layer	0.02	Root-restrictive layer	0.02
	Surface crusting	0.01	Surface crusting	0.01

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
CtA:				
Crosby	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Clay content	0.04	Surface crusting	0.45
	Root-restrictive layer	0.01	Clay content	0.04
	Available water capacity	0.01	Root-restrictive layer	0.01
			Available water capacity	0.01
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Root-restrictive layer	0.20	Surface crusting	0.45
			Root-restrictive layer	0.20
CtB:				
Crosby	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Root-restrictive layer	0.34	Surface crusting	0.45
	Available water capacity	0.17	Root-restrictive layer	0.34
	Erosion hazard	0.15	Available water capacity	0.17
	Clay content	0.04	Erosion hazard	0.15
			Clay content	0.04
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.09	Surface crusting	0.45
	Root-restrictive layer	0.01	Erosion hazard	0.09
			Root-restrictive layer	0.01

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
CvA:				
Crosby	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Root-restrictive layer	0.09	Surface crusting	0.45
	Available water capacity	0.01	Root-restrictive layer	0.09
			Available water capacity	0.01
Lewisburg	Very limited		Very limited	
	Seasonal high water table	1.00	Root-restrictive layer	1.00
	Root-restrictive layer	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45
CyA:				
Cyclone	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ponding	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
			Ground-water pollution	0.50
DaA:				
Dana	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
			Susceptible to compaction	0.50
DaB:				
Dana	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Erosion hazard	0.14	Susceptible to compaction	0.50
				0.50
			Erosion hazard	0.14
EeA:				
Eel	Very limited		Very limited	
	Ground-water pollution	1.00	Frost action	1.00
	Flooding	1.00	Ground-water pollution	1.00
	Susceptible to compaction	0.50	Flooding	1.00
	Surface crusting	0.11	Susceptible to compaction	0.50
			Surface crusting	0.11

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
EgA:				
Eldean--------------	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Available water capacity	0.55	Available water capacity	0.55
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
EgB:				
Eldean--------------	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Available water capacity	0.55	Available water capacity	0.55
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
	Erosion hazard	0.10	Erosion hazard	0.10
EgB2:				
Eldean--------------	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Root-restrictive layer	0.83	Root-restrictive layer	0.83
	Available water capacity	0.73	Available water capacity	0.73
	Tilth	0.10	Tilth	0.10
	Erosion hazard	0.10	Erosion hazard	0.10
EhC3:				
Eldean--------------	Very limited		Very limited	
	Ground-water pollution	1.00	Easily eroded	1.00
	Easily eroded	1.00	Tilth	1.00
	Tilth	1.00	Ground-water pollution	1.00
	Root-restrictive layer	0.98	Root-restrictive layer	0.98
	Available water capacity	0.84	Available water capacity	0.84
EhD3:				
Eldean--------------	Very limited		Very limited	
	Ground-water pollution	1.00	Tilth	1.00
	Tilth	1.00	Ground-water pollution	1.00
	Easily eroded	0.97	Easily eroded	0.97
	Available water capacity	0.27	Available water capacity	0.27
	Root-restrictive layer	0.13	Root-restrictive layer	0.13
	Clay content	0.03	Clay content	0.03

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
EkA:				
Eldean	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Root-restrictive layer	0.09	Root-restrictive layer	0.09
	Available water capacity	0.06	Available water capacity	0.06
	Clay content	0.01	Clay content	0.01
EkB:				
Eldean	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Erosion hazard	0.27	Erosion hazard	0.27
	Root-restrictive layer	0.20	Root-restrictive layer	0.20
	Available water capacity	0.17	Available water capacity	0.17
	Clay content	0.03	Clay content	0.03
EkB2:				
Eldean	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Root-restrictive layer	0.34	Root-restrictive layer	0.34
	Available water capacity	0.32	Available water capacity	0.32
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.25	Tilth	0.25
	Clay content	0.03	Clay content	0.03
FcA, FdA:				
Fincastle	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45
FmA:				
Fox	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Root-restrictive layer	0.05	Root-restrictive layer	0.05
FmB:				
Fox	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Erosion hazard	0.27	Erosion hazard	0.27
	Root-restrictive layer	0.05	Root-restrictive layer	0.05

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
FmB2:				
Fox-----------------	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.25	Tilth	0.25
	Root-restrictive layer	0.02	Root-restrictive layer	0.02
HeF2:				
Hennepin------------	Very limited		Very limited	
	Root-restrictive layer	1.00	Root-restrictive layer	1.00
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.40	Tilth	0.40
Miamian-------------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.59	Root-restrictive layer	0.59
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
HwE2:				
Hennepin------------	Very limited		Very limited	
	Root-restrictive layer	1.00	Root-restrictive layer	1.00
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.40	Tilth	0.40
	Slope	0.10	Slope	0.10
Wynn----------------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Ground-water pollution	0.50	Ground-water pollution	0.50
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
	Available water capacity	0.03	Available water capacity	0.03

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
HwF2:				
Hennepin	Very limited		Very limited	
	Root-restrictive layer	1.00	Root-restrictive layer	1.00
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.40	Tilth	0.40
Wynn	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.92	Root-restrictive layer	0.92
	Ground-water pollution	0.68	Ground-water pollution	0.68
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Available water capacity	0.49	Available water capacity	0.49
	Tilth	0.25	Tilth	0.25
KeC2:				
Kendallville	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
Eldean	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.83	Root-restrictive layer	0.83
	Available water capacity	0.61	Available water capacity	0.61
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
KeD2:				
Kendallville	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Root-restrictive layer	0.34	Root-restrictive layer	0.34
	Tilth	0.25	Tilth	0.25

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
KeD2:				
Eldean	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Available water capacity	0.33	Available water capacity	0.33
	Tilth	0.25	Tilth	0.25
	Root-restrictive layer	0.25	Root-restrictive layer	0.25
KnA:				
Kokomo	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ponding	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
			Ground-water pollution	0.50
KoA:				
Kokomo	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ponding	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Tilth	0.28	Ground-water pollution	0.50
			Tilth	0.28
LeB:				
Lewisburg	Very limited		Very limited	
	Seasonal high water table	1.00	Root-restrictive layer	1.00
	Root-restrictive layer	1.00	Frost action	1.00
	Easily eroded	0.72	Seasonal high water table	1.00
	Susceptible to compaction	0.50	Easily eroded	0.72
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
	Root-restrictive layer	0.20	Erosion hazard	0.27
			Root-restrictive layer	0.20

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
LfB2:				
Lewisburg-----------	Very limited		Very limited	
	Seasonal high water table	1.00	Root-restrictive layer	1.00
	Root-restrictive layer	1.00	Frost action	1.00
			Surface crusting	1.00
	Surface crusting	1.00	Susceptible to compaction	1.00
	Susceptible to compaction	1.00	Seasonal high water table	1.00
	Easily eroded	0.72	Easily eroded	0.72
	Tilth	0.25	Tilth	0.25
Celina--------------	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Susceptible to compaction	1.00	Surface crusting	1.00
	Restricted permeability	1.00	Susceptible to compaction	1.00
			Restricted permeability	1.00
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
	Tilth	0.25	Tilth	0.25
	Erosion hazard	0.14	Erosion hazard	0.14
LgC3:				
Lewisburg-----------	Very limited		Very limited	
	Seasonal high water table	1.00	Root-restrictive layer	1.00
	Root-restrictive layer	1.00	Frost action	1.00
			Tilth	1.00
	Tilth	1.00	Susceptible to compaction	1.00
	Susceptible to compaction	1.00	Surface crusting	1.00
	Surface crusting	1.00	Seasonal high water table	1.00
	Easily eroded	0.96	Easily eroded	0.96
LpA:				
Lippincott----------	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
			Frost action	1.00
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Ponding	1.00	Seasonal high water table	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.39	Tilth	0.39
	Root-restrictive layer	0.09	Root-restrictive layer	0.09
	Available water capacity	0.01	Available water capacity	0.01

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
MaA:				
Medway	Very limited		Very limited	
	Flooding	1.00	Frost action	1.00
	Ground-water pollution	0.75	Flooding	1.00
	Susceptible to compaction	0.50	Ground-water pollution	0.75
			Susceptible to compaction	0.50
MbB2:				
Miami	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Tilth	0.60	Tilth	0.60
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.32	Erosion hazard	0.32
	Available water capacity	0.20	Available water capacity	0.20
McE2:				
Miami	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Tilth	0.60	Tilth	0.60
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Root-restrictive layer	0.41	Root-restrictive layer	0.41
	Available water capacity	0.16	Available water capacity	0.16
	Slope	0.10	Slope	0.10
Kendallville	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Root-restrictive layer	0.41	Root-restrictive layer	0.41
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
McF2:				
Miami	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Tilth	0.60	Tilth	0.60
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Available water capacity	0.23	Available water capacity	0.23

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
McF2:				
Kendallville	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Tilth	0.25	Tilth	0.25
MdC2:				
Miami	Very limited		Very limited	
	Tilth	1.00	Tilth	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.83	Root-restrictive layer	0.83
	Available water capacity	0.44	Available water capacity	0.44
MdD2:				
Miami	Very limited		Very limited	
	Tilth	1.00	Tilth	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
	Available water capacity	0.19	Available water capacity	0.19
MeC:				
Miamian	Very limited		Very limited	
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.92	Root-restrictive layer	0.92
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
MeC2:				
Miamian	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.59	Root-restrictive layer	0.59
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
MeD2:				
Miamian	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.75	Root-restrictive layer	0.75
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MfB:				
Miamian	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Erosion hazard	0.27	Erosion hazard	0.27
	Root-restrictive layer	0.13	Root-restrictive layer	0.13
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
	Root-restrictive layer	0.20	Erosion hazard	0.27
			Root-restrictive layer	0.20
MfB2:				
Miamian	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.25	Tilth	0.25
	Root-restrictive layer	0.09	Root-restrictive layer	0.09
Celina	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Restricted permeability	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Restricted permeability	1.00
	Erosion hazard	0.27	Susceptible to compaction	0.50
	Tilth	0.25	Erosion hazard	0.27
	Root-restrictive layer	0.25	Tilth	0.25
			Root-restrictive layer	0.25
MgE2:				
Miamian	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
	Root-restrictive layer	0.02	Root-restrictive layer	0.02

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MgE2:				
Kendallville--------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.59	Root-restrictive layer	0.59
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
MgF2:				
Miamian-------------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
Kendallville--------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
	Root-restrictive layer	0.13	Root-restrictive layer	0.13
MhC3:				
Miamian-------------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Tilth	1.00	Tilth	1.00
	Susceptible to compaction	1.00	Susceptible to compaction	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.83	Root-restrictive layer	0.83
Losantville---------	Very limited		Very limited	
	Seasonal high water table	1.00	Root-restrictive layer	1.00
	Root-restrictive layer	1.00	Easily eroded	1.00
	Easily eroded	1.00	Tilth	1.00
	Tilth	1.00	Susceptible to compaction	1.00
	Susceptible to compaction	1.00	Surface crusting	1.00
	Surface crusting	1.00	Seasonal high water table	1.00
	Available water capacity	0.91	Available water capacity	0.91
	Ground-water pollution	0.50	Ground-water pollution	0.50

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MhD3:				
Miamian	Very limited		Very limited	
	Tilth	1.00	Tilth	1.00
	Susceptible to compaction	1.00	Susceptible to compaction	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.96	Easily eroded	0.96
	Root-restrictive layer	0.25	Root-restrictive layer	0.25
Losantville	Very limited		Very limited	
	Seasonal high water table	1.00	Root-restrictive layer	1.00
	Root-restrictive layer	1.00	Tilth	1.00
	Tilth	1.00	Susceptible to compaction	1.00
	Susceptible to compaction	1.00	Surface crusting	1.00
	Surface crusting	1.00	Seasonal high water table	1.00
	Available water capacity	0.99	Available water capacity	0.99
	Easily eroded	0.96	Easily eroded	0.96
	Ground-water pollution	0.50	Ground-water pollution	0.50
MmE2:				
Miamian	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.83	Root-restrictive layer	0.83
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
Hennepin	Very limited		Very limited	
	Root-restrictive layer	1.00	Root-restrictive layer	1.00
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.40	Tilth	0.40
	Slope	0.10	Slope	0.10
MnE3:				
Miamian	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Tilth	1.00	Tilth	1.00
	Susceptible to compaction	1.00	Susceptible to compaction	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.83	Root-restrictive layer	0.83
	Slope	0.10	Slope	0.10

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
MnE3:				
Hennepin	Very limited		Very limited	
	Root-restrictive layer	1.00	Root-restrictive layer	1.00
	Easily eroded	1.00	Easily eroded	1.00
	Tilth	1.00	Tilth	1.00
	Susceptible to compaction	1.00	Susceptible to compaction	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Slope	0.10	Slope	0.10
MpA, MrA:				
Milford	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Tilth	1.00	Frost action	1.00
	Ponding	1.00	Tilth	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Clay content	0.01	Ground-water pollution	0.50
			Clay content	0.01
MsA:				
Millsdale	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ponding	1.00	Frost action	1.00
	Root-restrictive layer	0.87	Seasonal high water table	1.00
	Ground-water pollution	0.65	Root-restrictive layer	0.87
	Available water capacity	0.51	Ground-water pollution	0.65
	Susceptible to compaction	0.50	Available water capacity	0.51
	Clay content	0.01	Susceptible to compaction	0.50
			Clay content	0.01
MtA:				
Millsdale	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ponding	1.00	Frost action	1.00
	Root-restrictive layer	0.52	Seasonal high water table	1.00
	Susceptible to compaction	0.50	Root-restrictive layer	0.52
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Ground-water pollution	0.50
	Available water capacity	0.21	Tilth	0.25
	Clay content	0.01	Available water capacity	0.21
			Clay content	0.01

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
MuA:				
Milton	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Ground-water pollution	0.46	Ground-water pollution	0.46
	Surface crusting	0.45	Surface crusting	0.45
	Root-restrictive layer	0.41	Root-restrictive layer	0.41
	Available water capacity	0.14	Available water capacity	0.14
MuB:				
Milton	Somewhat limited		Somewhat limited	
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Ground-water pollution	0.56	Ground-water pollution	0.56
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Available water capacity	0.36	Available water capacity	0.36
	Erosion hazard	0.27	Erosion hazard	0.27
MuB2:				
Milton	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Ground-water pollution	0.56	Ground-water pollution	0.56
	Available water capacity	0.53	Available water capacity	0.53
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.25	Tilth	0.25
MuC2:				
Milton	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Available water capacity	0.60	Available water capacity	0.60
	Ground-water pollution	0.56	Ground-water pollution	0.56
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MuD2:				
Milton	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.59	Root-restrictive layer	0.59
	Ground-water pollution	0.53	Ground-water pollution	0.53
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Available water capacity	0.42	Available water capacity	0.42
	Tilth	0.25	Tilth	0.25
MuE2:				
Milton	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.96	Root-restrictive layer	0.96
	Available water capacity	0.92	Available water capacity	0.92
	Ground-water pollution	0.71	Ground-water pollution	0.71
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
	Clay content	0.02	Clay content	0.02
MwA:				
Morningsun	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Ground-water pollution	0.50
			Surface crusting	0.45
MxA:				
Morningsun	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Ground-water pollution	0.50
			Surface crusting	0.45
Xenia	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MxB:				
Morningsun----------	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Ground-water pollution	0.50
	Erosion hazard	0.27	Surface crusting	0.45
			Erosion hazard	0.27
Xenia---------------	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
			Erosion hazard	0.27
MxB2:				
Morningsun----------	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Surface crusting	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Ground-water pollution	0.50
	Tilth	0.25	Erosion hazard	0.27
			Tilth	0.25
Xenia---------------	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Surface crusting	1.00
	Erosion hazard	0.27	Susceptible to compaction	0.50
	Tilth	0.25	Erosion hazard	0.27
			Tilth	0.25
MyA:				
Mahalasville--------	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ponding	1.00	Frost action	1.00
	Ground-water pollution	0.75	Seasonal high water table	1.00
	Susceptible to compaction	0.50	Ground-water pollution	0.75
			Susceptible to compaction	0.50
OcA:				
Ockley--------------	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Surface crusting	0.70	Surface crusting	0.70
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.04	Tilth	0.04
	Available water capacity	0.01	Available water capacity	0.01

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
OcB:				
Ockley	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Surface crusting	0.70	Surface crusting	0.70
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.04	Tilth	0.04
	Available water capacity	0.01	Available water capacity	0.01
Pg, Pq:				
Pits	Not rated		Not rated	
PtB:				
Plattville	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Ground-water pollution	0.50	Ground-water pollution	0.50
	Erosion hazard	0.14	Erosion hazard	0.14
	Surface crusting	0.01	Surface crusting	0.01
RaA:				
Rainsville	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
RaB:				
Rainsville	Very limited		Very limited	
	Easily eroded	0.80	Easily eroded	0.80
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
RaB2:				
Rainsville	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.80	Easily eroded	0.80
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
RcA:				
Randolph	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Ground-water pollution	0.50
	Root-restrictive layer	0.25	Surface crusting	0.45
	Available water capacity	0.21	Root-restrictive layer	0.25
	Clay content	0.04	Available water capacity	0.21
			Clay content	0.04

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
RcB:				
Randolph	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Available water capacity	0.48	Ground-water pollution	0.50
	Surface crusting	0.45	Available water capacity	0.48
	Root-restrictive layer	0.34	Surface crusting	0.45
	Erosion hazard	0.27	Root-restrictive layer	0.34
	Clay content	0.04	Erosion hazard	0.27
			Clay content	0.04
RnE2:				
Rodman	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Available water capacity	1.00	Available water capacity	1.00
	Easily eroded	0.96	Easily eroded	0.96
	Slope	0.10	Slope	0.10
RnF2:				
Rodman	Very limited		Very limited	
	Ground-water pollution	1.00	Easily eroded	1.00
	Easily eroded	1.00	Ground-water pollution	1.00
	Available water capacity	1.00	Available water capacity	1.00
	Slope	1.00	Slope	1.00
RoE2:				
Rodman	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Available water capacity	1.00	Available water capacity	1.00
	Easily eroded	0.96	Easily eroded	0.96
	Slope	0.10	Slope	0.10
Kendallville	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Tilth	0.25	Tilth	0.25
	Slope	0.10	Slope	0.10
RoF2:				
Rodman	Very limited		Very limited	
	Ground-water pollution	1.00	Easily eroded	1.00
	Easily eroded	1.00	Ground-water pollution	1.00
	Available water capacity	1.00	Available water capacity	1.00
	Slope	1.00	Slope	1.00

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
RoF2:				
Kendallville--------	Very limited		Very limited	
	Easily eroded	1.00	Easily eroded	1.00
	Slope	1.00	Slope	1.00
	Tilth	0.25	Tilth	0.25
RpA:				
Rossburg------------	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Flooding	1.00	Flooding	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
RuB:				
Russell-------------	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Surface crusting	1.00
	Tilth	0.40	Susceptible to compaction	0.50
	Erosion hazard	0.27	Tilth	0.40
			Erosion hazard	0.27
Miamian-------------	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Surface crusting	0.45
	Root-restrictive layer	0.34	Root-restrictive layer	0.34
	Erosion hazard	0.27	Erosion hazard	0.27
RuB2:				
Russell-------------	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Tilth	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Tilth	1.00
	Erosion hazard	0.27	Susceptible to compaction	0.50
			Erosion hazard	0.27
Miamian-------------	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.25	Tilth	0.25
	Root-restrictive layer	0.25	Root-restrictive layer	0.25
SeA:				
Savona--------------	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Surface crusting	0.70	Seasonal high water table	1.00
	Susceptible to compaction	0.50	Surface crusting	0.70
	Tilth	0.04	Susceptible to compaction	0.50
			Tilth	0.04

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
SnA:				
Sloan	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ground-water pollution	1.00	Frost action	1.00
	Ponding	1.00	Ground-water pollution	1.00
	Flooding	1.00	Seasonal high water table	1.00
	Susceptible to compaction	0.50	Flooding	1.00
			Susceptible to compaction	0.50
StA:				
Stonelick	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Flooding	1.00	Flooding	1.00
	Tilth	0.40	Tilth	0.40
SvA:				
Sugarvalley	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Ground-water pollution	0.50
			Surface crusting	0.45
SwA:				
Sugarvalley	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Ground-water pollution	0.50	Susceptible to compaction	0.50
	Surface crusting	0.45	Ground-water pollution	0.50
			Surface crusting	0.45
Fincastle	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45
ThA:				
Thackery	Very limited		Very limited	
	Seasonal high water table	1.00	Frost action	1.00
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans		Limitations for wheat	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ThB:				
Thackery	Very limited		Very limited	
	Ground-water pollution	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Ground-water pollution	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
			Erosion hazard	0.27
Ud:				
Udorthents	Not rated		Not rated	
W:				
Water	Not rated		Not rated	
WbA:				
Warsaw	Very limited		Very limited	
	Ground-water pollution	1.00	Ground-water pollution	1.00
	Root-restrictive layer	0.52	Root-restrictive layer	0.52
WnA:				
Westland	Very limited		Very limited	
	Seasonal high water table	1.00	Ponding	1.00
	Ground-water pollution	1.00	Frost action	1.00
	Ponding	1.00	Ground-water pollution	1.00
	Susceptible to compaction	0.50	Seasonal high water table	1.00
			Susceptible to compaction	0.50
WyB:				
Wynn	Somewhat limited		Somewhat limited	
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Ground-water pollution	0.46	Ground-water pollution	0.46
	Surface crusting	0.45	Surface crusting	0.45
	Root-restrictive layer	0.41	Root-restrictive layer	0.41
	Erosion hazard	0.27	Erosion hazard	0.27
	Available water capacity	0.11	Available water capacity	0.11
WyB2:				
Wynn	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Ground-water pollution	0.56	Ground-water pollution	0.56
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Erosion hazard	0.27	Erosion hazard	0.27
	Tilth	0.25	Tilth	0.25
	Available water capacity	0.14	Available water capacity	0.14

Table 5.—Cropland Limitation Ratings—Continued

Map symbol and soil name	Limitations for corn and soybeans: Rating class and limiting features	Value	Limitations for wheat: Rating class and limiting features	Value
WyC2:				
Wynn----------------	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.96	Root-restrictive layer	0.96
	Ground-water pollution	0.71	Ground-water pollution	0.71
	Available water capacity	0.59	Available water capacity	0.59
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
WyD2:				
Wynn----------------	Very limited		Very limited	
	Surface crusting	1.00	Surface crusting	1.00
	Easily eroded	0.98	Easily eroded	0.98
	Root-restrictive layer	0.69	Root-restrictive layer	0.69
	Ground-water pollution	0.56	Ground-water pollution	0.56
	Susceptible to compaction	0.50	Susceptible to compaction	0.50
	Tilth	0.25	Tilth	0.25
	Available water capacity	0.12	Available water capacity	0.12
XeA:				
Xenia---------------	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
			Surface crusting	0.45
XeB:				
Xenia---------------	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
			Erosion hazard	0.27
XeB2:				
Xenia---------------	Very limited		Very limited	
	Surface crusting	1.00	Frost action	1.00
	Susceptible to compaction	0.50	Surface crusting	1.00
	Erosion hazard	0.27	Susceptible to compaction	0.50
	Tilth	0.25	Erosion hazard	0.27
			Tilth	0.25
XfB:				
Xenia---------------	Somewhat limited		Very limited	
	Susceptible to compaction	0.50	Frost action	1.00
	Surface crusting	0.45	Susceptible to compaction	0.50
	Erosion hazard	0.27	Surface crusting	0.45
			Erosion hazard	0.27

Table 6.—Pasture and Hayland Suitability Group and Yields per Acre of Pasture and Hayland

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fescue	Orchardgrass-alfalfa hay	Orchardgrass-red clover hay
		AUM	AUM	Tons	Tons
CeA, CeB, CeB2:		3.6	5.6	5.4	4.5
Celina	A-6				
CoA:		3.6	6.0	5.0	5.0
Corwin	A-1				
CtA, CtB:		3.6	5.6	5.4	4.5
Crosby	C-1				
Celina	A-6				
CvA:		3.6	5.6	5.4	4.5
Crosby	C-1				
Lewisburg	A-6				
CyA:		3.2	4.8	5.0	5.8
Cyclone	C-1				
DaA:		3.2	5.2	5.4	5.8
Dana	A-6				
DaB:		3.2	5.6	5.4	5.2
Dana	A-6				
EeA:		3.0	5.6	5.0	4.5
Eel	A-5				
EgA:		3.2	6.0	5.0	4.5
Eldean	B-1				
EgB:		3.2	5.5	5.0	4.5
Eldean	B-1				
EgB2:		3.2	5.0	5.0	4.0
Eldean	B-1				
EhC3:		2.5	4.0	3.0	3.0
Eldean	B-1				
EhD3:		2.5	3.0	2.5	2.5
Eldean	B-1				
EkA:		3.2	4.5	5.0	5.0
Eldean	B-1				
EkB:		3.2	5.0	5.0	4.5
Eldean	B-1				
EkB2:		3.2	4.5	5.0	4.5
Eldean	B-1				
FcA, FdA:		3.2	4.5	5.0	5.5
Fincastle	C-1				
FmA:		3.2	5.5	5.0	4.5
Fox	A-1				

Table 6.—Pasture and Hayland Suitability Group and Yields per Acre of Pasture and Hayland—Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fescue	Orchardgrass-alfalfa hay	Orchardgrass-red clover hay
		AUM	AUM	Tons	Tons
FmB:		3.2	5.0	5.0	4.5
Fox	A-1				
FmB2:		3.2	4.5	5.0	4.2
Fox	A-1				
HeF2:		1.0	2.0	2.0	2.0
Hennepin	A-3				
Miamian	A-3				
HwE2:		1.5	3.0	2.0	2.0
Hennepin	A-2				
Wynn	F-1				
HwF2:		1.0	2.0	2.0	2.0
Hennepin	A-3				
Wynn	F-2				
KeC2:		2.8	3.4	3.6	4.0
Kendallville	A-1				
Eldean	B-1				
KeD2:		2.5	3.0	3.0	3.2
Kendallville	A-1				
Eldean	B-1				
KnA, KoA:		3.2	4.0	5.0	5.8
Kokomo	C-1				
LeB, LfB2:		2.8	3.2	4.0	4.0
Lewisburg	A-6				
Celina	A-6				
LgC3:		2.0	2.8	3.0	2.3
Lewisburg	A-6				
LpA:		3.2	3.2	5.5	5.0
Lippincott	C-1				
MaA:		3.0	3.2	5.0	5.8
Medway	A-5				
MbB2:		2.8	3.2	5.0	4.0
Miami	B-1				
McE2:		1.5	3.0	2.0	2.0
Miami	B-1				
Kendallville	A-2				
McF2:		1.0	2.0	2.0	2.0
Miami	B-2				
Kendallville	A-3				
MdC2, MdD2:		2.8	3.2	5.0	4.0
Miami	B-1				
MeC, MeC2:		2.8	3.2	5.0	4.0
Miamian	A-1				

Table 6.—Pasture and Hayland Suitability Group and Yields per Acre of Pasture and Hayland—Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fescue	Orchardgrass-alfalfa hay	Orchardgrass-red clover hay
		AUM	AUM	Tons	Tons
MeD2:		2.5	3.0	4.5	3.5
Miamian-------------	A-1				
MfB, MfB2:		2.8	3.2	5.0	4.0
Miamian-------------	A-1				
Celina--------------	A-6				
MgE2:		1.5	3.0	2.0	2.0
Miamian-------------	A-2				
Kendallville--------	A-2				
MgF2:		1.0	2.0	2.0	2.0
Miamian-------------	A-3				
Kendallville--------	A-3				
MhC3:		2.5	2.8	4.0	3.5
Miamian-------------	A-1				
Losantville---------	B-1				
MhD3:		2.3	2.2	3.0	3.0
Miamian-------------	A-1				
Losantville---------	B-1				
MmE2:		1.5	3.0	2.0	2.0
Miamian-------------	A-2				
Hennepin------------	A-2				
MnE3:		1.0	2.0	2.0	2.0
Miamian-------------	A-2				
Hennepin------------	A-2				
MpA, MrA:		2.8	3.2	5.0	4.0
Milford-------------	C-1				
MsA:		2.8	2.5	5.0	4.0
Millsdale-----------	C-2				
MtA:		2.5	2.5	5.0	4.0
Millsdale-----------	C-2				
MuA, MuB, MuB2, MuC2, MuD2:		2.8	3.2	5.0	4.0
Milton-------------	F-1				
MuE2:		1.5	3.0	2.0	2.0
Milton--------------	F-1				
MwA:		3.8	4.5	5.8	6.0
Morningsun----------	A-6				
MxA, MxB, MxB2:		3.8	4.5	5.8	6.0
Morningsun----------	A-6				
Xenia---------------	A-6				
MyA:		2.8	3.2	5.0	4.0
Mahalasville--------	C-1				
OcA, OcB:		3.8	4.5	5.8	6.0
Ockley--------------	B-1				

Table 6.—Pasture and Hayland Suitability Group and Yields per Acre of Pasture and Hayland—Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fescue	Orchardgrass-alfalfa hay	Orchardgrass-red clover hay
		AUM	AUM	Tons	Tons
Pg, Pq.					
Pits					
PtB:		3.6	6.0	5.0	5.0
Plattville----------	A-1				
RaA, RaB, RaB2:		3.8	4.5	5.8	6.0
Rainsville----------	A-1				
RcA, RcB:		3.8	4.5	5.8	6.0
Randolph------------	C-2				
RnE2:		1.5	3.0	2.0	2.0
Rodman--------------	B-1				
RnF2:		1.0	2.0	2.0	2.0
Rodman--------------	B-2				
RoE2:		1.5	3.0	2.0	2.0
Rodman--------------	B-1				
Kendallville--------	A-2				
RoF2:		1.0	2.0	2.0	2.0
Rodman--------------	B-2				
Kendallville--------	A-3				
RpA:		3.8	4.5	5.8	6.0
Rossburg------------	A-5				
RuB, RuB2:		3.8	4.5	5.8	6.0
Russell-------------	A-6				
Miamian-------------	A-1				
SeA:		3.8	3.5	4.5	5.0
Savona--------------	C-1				
SnA:		3.8	4.5	5.8	6.0
Sloan---------------	C-3				
StA:		3.8	4.5	5.8	6.0
Stonelick-----------	A-5				
SvA:		3.8	4.5	5.8	6.0
Sugarvalley---------	C-1				
SwA:		3.8	4.5	5.8	6.0
Sugarvalley---------	C-1				
Fincastle-----------	C-1				
ThA, ThB:		3.8	4.5	5.8	6.0
Thackery------------	A-6				
Ud.					
Udorthents					
W.					
Water					
WbA:		3.8	4.5	5.8	6.0
Warsaw--------------	A-1				

Table 6.—Pasture and Hayland Suitability Group and Yields per Acre of Pasture and Hayland—Continued

Map symbol and soil name	Pasture and hayland suitability group	Kentucky bluegrass	Tall fescue	Orchardgrass-alfalfa hay	Orchardgrass-red clover hay
		AUM	AUM	Tons	Tons
WnA:		3.5	4.0	5.4	5.8
Westland	C-1				
WyB, WyB2, WyC2, WyD2:		3.0	4.0	4.5	5.0
Wynn	F-1				
XeA, XeB, XeB2, XfB:		3.2	4.5	5.5	5.0
Xenia	A-6				

Table 7.—Crop Yield Index

(This table is based on yields from the years 1992-2000. Estimated yields for soils with a yield index of 100 are: corn - 160 bushels; soybeans - 60 bushels; and wheat - 70 bushels. Refer to the text for more information on how this table was developed and for instructions on converting yield index numbers to estimated yields. Absence of a yield index indicates that the soil is not suited to the crop or the crop is generally not grown on the soil)

Map symbol and soil name	Corn	Soybeans	Winter wheat
CeA:			
Celina	88	77	97
CeB:			
Celina	84	72	87
CeB2:			
Celina	80	67	79
CoA:			
Corwin	97	97	100
CtA:			
Crosby-Celina	81	80	83
CtB:			
Crosby-Celina	79	72	79
CvA:			
Crosby-Lewisburg	81	80	83
CyA:			
Cyclone	100	100	93
DaA:			
Dana	91	83	91
DaB:			
Dana	88	75	91
EeA:			
Eel	86	78	---
EgA:			
Eldean	78	72	86
EgB:			
Eldean	70	65	77
EgB2:			
Eldean	62	57	69
EhC3:			
Eldean	46	43	51
EhD3:			
Eldean	39	37	43
EkA:			
Eldean	78	72	86
EkB:			
Eldean	70	65	77

Table 7.—Crop Yield Index—Continued

Map symbol and soil name	Corn	Soybeans	Winter wheat
EkB2:			
Eldean	62	58	57
FcA:			
Fincastle	91	82	93
FdA:			
Fincastle	91	82	93
FmA:			
Fox	72	67	80
FmB:			
Fox	65	60	71
FmB2:			
Fox	58	53	64
KeC2:			
Kendallville-Eldean	56	52	63
KeD2:			
Kendallville-Eldean	45	42	51
KnA:			
Kokomo	97	87	93
KoA:			
Kokomo	97	87	93
LeB:			
Lewisburg-Celina	68	63	76
LfB2:			
Lewisburg-Celina	61	55	67
LgC3:			
Lewisburg	45	42	50
LpA:			
Lippincott	83	77	86
MaA:			
Medway	95	87	---
MbB2:			
Miami	72	67	83
MdC2:			
Miami	62	57	69
MdD2:			
Miami	57	50	64
MeC:			
Miamian	66	62	74
MeC2:			
Miamian	62	57	69
MeD2:			
Miamian	54	48	60

Table 7.—Crop Yield Index—Continued

Map symbol and soil name	Corn	Soybeans	Winter wheat
MfB:			
Miamian-Celina	78	72	87
MfB2:			
Miamian-Celina	70	63	77
MhC3:			
Miamian-Losantville	52	48	59
MhD3:			
Miamian-Losantville	43	40	49
MpA:			
Milford	90	83	86
MrA:			
Milford	90	83	86
MsA:			
Millsdale	86	78	79
MtA:			
Millsdale	83	77	79
MuA:			
Milton	88	70	86
MuB:			
Milton	77	63	77
MuB2:			
Milton	69	57	69
MuC2:			
Milton	54	48	60
MuD2:			
Milton	47	40	51
MwA:			
Morningsun	92	87	97
MxA:			
Morningsun-Xenia	92	87	97
MxB:			
Morningsun-Xenia	88	80	97
MxB2:			
Morningsun-Xenia	84	73	93
MyA:			
Mahalasville	90	83	86
OcA:			
Ockley	88	87	93
OcB:			
Ockley	86	83	93
PtB:			
Plattville	97	97	97

Table 7.—Crop Yield Index—Continued

Map symbol and soil name	Corn	Soybeans	Winter wheat
RaA:			
Rainsville	84	78	94
RaB:			
Rainsville	81	75	89
RaB2:			
Rainsville	80	67	83
RcA:			
Randolph	79	67	79
RcB:			
Randolph	71	60	71
RpA:			
Rossburg	94	92	---
RuB:			
Russell-Miamian	80	73	86
RuB2:			
Russell-Miamian	74	70	79
SeA:			
Savona	88	77	80
SnA:			
Sloan	80	73	---
StA:			
Stonelick	74	68	---
SvA:			
Sugarvalley	91	82	93
SwA:			
Sugarvalley-Fincastle	91	82	93
ThA:			
Thackery	84	75	86
ThB:			
Thackery	84	72	83
WbA:			
Warsaw	81	75	90
WnA:			
Westland	97	97	97
WyB:			
Wynn	72	67	80
WyB2:			
Wynn	65	60	71
WyC2:			
Wynn	57	53	63
WyD2:			
Wynn	50	47	54

Table 7.—Crop Yield Index—Continued

Map symbol and soil name	Corn	Soybeans	Winter wheat
XeA:			
Xenia-------------------	92	87	97
XeB:			
Xenia-------------------	88	80	97
XeB2:			
Xenia-------------------	84	73	86
XfB:			
Xenia-------------------	88	80	97

Table 8.—Acreage by Capability Classes and Subclasses

Capability class	Capability subclass	Acreage
Unclassified	---	2,070
1	---	14,037
2	e	103,923
	w	89,288
	s	2,914
3	e	20,587
	w	6,318
4	e	16,356
	w	256
6	e	9,864
7	e	6,685
	s	649

Table 9.—Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
CeA	Celina silt loam, 0 to 2 percent slopes
CeB	Celina silt loam, 2 to 6 percent slopes
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded
CoA	Corwin silt loam, 0 to 2 percent slopes
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes (if drained)
CtB	Crosby-Celina silt loams, 2 to 4 percent slopes (if drained)
CvA	Crosby-Lewisburg silt loams, 0 to 2 percent slopes (if drained)
CyA	Cyclone silt loam, 0 to 2 percent slopes (if drained)
DaA	Dana silt loam, 0 to 2 percent slopes
DaB	Dana silt loam, 2 to 6 percent slopes
EeA	Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded
EgA	Eldean gravelly loam, 0 to 2 percent slopes
EgB	Eldean gravelly loam, 2 to 6 percent slopes
EgB2	Eldean gravelly loam, 2 to 6 percent slopes, eroded
EkA	Eldean loam, 0 to 2 percent slopes
EkB	Eldean loam, 2 to 6 percent slopes
EkB2	Eldean loam, 2 to 6 percent slopes, eroded
FcA	Fincastle silt loam, 0 to 2 percent slopes (if drained)
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes (if drained)
FmA	Fox silt loam, till substratum, 0 to 2 percent slopes
FmB	Fox silt loam, till substratum, 2 to 6 percent slopes
FmB2	Fox silt loam, till substratum, 2 to 6 percent slopes, eroded
KnA	Kokomo silt loam, 0 to 1 percent slopes (if drained)
KoA	Kokomo silty clay loam, 0 to 1 percent slopes (if drained)
LeB	Lewisburg-Celina silt loams, 2 to 6 percent slopes
LfB2	Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded
LpA	Lippincott silty clay loam, 0 to 2 percent slopes (if drained)
MaA	Medway silt loam, 0 to 1 percent slopes, occasionally flooded
MbB2	Miami silt loam, 2 to 6 percent slopes, eroded
MfB	Miamian-Celina silt loams, 2 to 6 percent slopes
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded
MpA	Milford silty clay loam, 0 to 2 percent slopes (if drained)
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes (if drained)
MsA	Millsdale silt loam, 0 to 2 percent slopes (if drained)
MtA	Millsdale silty clay loam, 0 to 2 percent slopes (if drained)
MuA	Milton silt loam, 0 to 2 percent slopes
MuB	Milton silt loam, 2 to 6 percent slopes
MuB2	Milton silt loam, 2 to 6 percent slopes, eroded
MwA	Morningsun silt loam, 0 to 2 percent slopes
MxA	Morningsun-Xenia silt loams, 0 to 2 percent slopes
MxB	Morningsun-Xenia silt loams, 2 to 6 percent slopes
MxB2	Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded
MyA	Mahalasville silt loam, 0 to 2 percent slopes (if drained)
OcA	Ockley silt loam, 0 to 2 percent slopes
OcB	Ockley silt loam, 2 to 6 percent slopes
PtB	Plattville silt loam, moderately wet, 2 to 6 percent slopes
RaA	Rainsville silt loam, 0 to 2 percent slopes
RaB	Rainsville silt loam, 2 to 6 percent slopes
RaB2	Rainsville silt loam, 2 to 6 percent slopes, eroded
RcA	Randolph silt loam, 0 to 2 percent slopes (if drained)
RcB	Randolph silt loam, 2 to 6 percent slopes (if drained)
RpA	Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded
RuB	Russell-Miamian silt loams, 2 to 6 percent slopes

Table 9.—Prime Farmland—Continued

Map symbol	Soil name
RuB2	Russell-Miamian silt loams, 2 to 6 percent slopes, eroded
SeA	Savona silt loam, 0 to 2 percent slopes (if drained)
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded (if drained and either protected from flooding or not frequently flooded during the growing season)
StA	Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded (if protected from flooding or not frequently flooded during the growing season)
SvA	Sugarvalley silt loam, 0 to 2 percent slopes (if drained)
SwA	Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes (if drained)
ThA	Thackery silt loam, 0 to 2 percent slopes
ThB	Thackery silt loam, 2 to 6 percent slopes
WbA	Warsaw loam, 0 to 2 percent slopes
WnA	Westland silt loam, 0 to 2 percent slopes (if drained)
WyB	Wynn silt loam, 2 to 6 percent slopes
WyB2	Wynn silt loam, 2 to 6 percent slopes, eroded
XeA	Xenia silt loam, 0 to 2 percent slopes
XeB	Xenia silt loam, 2 to 6 percent slopes
XeB2	Xenia silt loam, 2 to 6 percent slopes, eroded
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes

Table 10.—Hydric Soils

Map symbol	Soil name
CyA	Cyclone silt loam, 0 to 2 percent slopes
KnA	Kokomo silt loam, 0 to 1 percent slopes
KoA	Kokomo silty clay loam, 0 to 1 percent slopes
LpA	Lippincott silty clay loam, 0 to 2 percent slopes
MpA	Milford silty clay loam, 0 to 2 percent slopes
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes
MsA	Millsdale silt loam, 0 to 2 percent slopes
MtA	Millsdale silty clay loam, 0 to 2 percent slopes
MyA	Mahalasville silt loam, 0 to 2 percent slopes
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded
WnA	Westland silt loam, 0 to 2 percent slopes

Table 11.—Non-Hydric Map Units With Hydric Components

Map symbol and map unit name	Hydric component	Landform
CeA: Celina silt loam, 0 to 2 percent slopes		
	Kokomo	depression, till plain
CeB: Celina silt loam, 2 to 6 percent slopes		
	Kokomo	depression, till plain
CeB2: Celina silt loam, 2 to 6 percent slopes, eroded		
	Kokomo	depression, till plain
CoA: Corwin silt loam, 0 to 2 percent slopes		
	Kokomo	depression, till plain
CtA: Crosby-Celina silt loams, 0 to 2 percent slopes		
	Kokomo	depression, till plain
CtB: Crosby-Celina silt loams, 2 to 4 percent slopes		
	Kokomo	depression, till plain
CvA: Crosby-Lewisburg silt loams, 0 to 2 percent slopes		
	Kokomo	depression, till plain
DaA: Dana silt loam, 0 to 2 percent slopes		
	Cyclone	depression, till plain
DaB: Dana silt loam, 2 to 6 percent slopes		
	Cyclone	depression, till plain
EeA: Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded		
	Sloan	flood plain
FcA: Fincastle silt loam, 0 to 2 percent slopes		
	Cyclone	depression, till plain
FdA: Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes		
	Cyclone	depression, till plain

Table 11.—Non-Hydric Map Units With Hydric Components—Continued

Map symbol and map unit name	Hydric component	Landform
FmA:		
Fox silt loam, till substratum, 0 to 2 percent slopes		
	Westland	depression, outwash terrace
FmB:		
Fox silt loam, till substratum, 2 to 6 percent slopes		
	Westland	depression, outwash terrace
FmB2:		
Fox silt loam, till substratum, 2 to 6 percent slopes, eroded		
	Westland	depression, outwash terrace
LeB:		
Lewisburg-Celina silt loams, 2 to 6 percent slopes		
	Kokomo	depression, till plain
LfB2:		
Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded		
	Kokomo	depression, till plain
MaA:		
Medway silt loam, 0 to 1 percent slopes, occasionally flooded		
	Sloan	flood plain
MfB:		
Miamian-Celina silt loams, 2 to 6 percent slopes		
	Kokomo	depression, till plain
MfB2:		
Miamian-Celina silt loams, 2 to 6 percent slopes, eroded		
	Kokomo	depression, till plain
MwA:		
Morningsun silt loam, 0 to 2 percent slopes		
	Cyclone	depression, till plain
MxA:		
Morningsun-Xenia silt loams, 0 to 2 percent slopes		
	Cyclone	depression, till plain
PtB:		
Plattville silt loam, moderately wet, 2 to 6 percent slopes		
	Millsdale	depression, outwash terrace

Table 11.—Non-Hydric Map Units With Hydric Components—Continued

Map symbol and map unit name	Hydric component	Landform
RcA:		
Randolph silt loam, 0 to 2 percent slopes		
	Millsdale	depression, outwash terrace
RpA:		
Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded		
	Sloan	flood plain
SeA:		
Savona silt loam, 0 to 2 percent slopes		
	Lippincott	depression, outwash terrace
SvA:		
Sugarvalley silt loam, 0 to 2 percent slopes		
	Cyclone	depression, till plain
SwA:		
Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes		
	Cyclone	depression, till plain
ThA:		
Thackery silt loam, 0 to 2 percent slopes		
	Westland	depression, outwash terrace
ThB:		
Thackery silt loam, 2 to 6 percent slopes		
	Westland	depression, outwash terrace
XeA:		
Xenia silt loam, 0 to 2 percent slopes		
	Cyclone	depression, till plain
XfB:		
Xenia silt loam, bedrock substratum, 2 to 6 percent slopes		
	Cyclone	depression, till plain

Table 12.—Woodland Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina--------------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
CeB, CeB2:						
Celina--------------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
CoA:						
Corwin--------------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
CtA:						
Crosby--------------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Celina--------------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
CtB:						
Crosby--------------	Slight		High		Severe	
	Water erosion	0.07	Wetness	1.00	Low strength	1.00
Celina--------------	Slight		Low		Severe	
	Water erosion	0.07			Low strength	1.00
CvA:						
Crosby--------------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Lewisburg-----------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
CyA:						
Cyclone-------------	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
DaA:						
Dana----------------	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
DaB:						
Dana----------------	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
EeA:						
Eel-----------------	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
EgA:						
Eldean--------------	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Erosion hazard: Value	Seedling mortality: Rating class and limiting features	Seedling mortality: Value	Soil rutting hazard: Rating class and limiting features	Soil rutting hazard: Value
EgB, EgB2:						
Eldean	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
EhC3:						
Eldean	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
EhD3:						
Eldean	Moderate		Low		Severe	
	Water erosion	0.25			Low strength	1.00
EkA:						
Eldean	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
EkB, EkB2:						
Eldean	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
FcA, FdA:						
Fincastle	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
FmA:						
Fox	Slight		Moderate		Severe	
	Water erosion	0.02	Carbonate content	0.50	Low strength	1.00
FmB, FmB2:						
Fox	Slight		Moderate		Severe	
	Water erosion	0.10	Carbonate content	0.50	Low strength	1.00
HeF2:						
Hennepin	Severe		Moderate		Severe	
	Water erosion	0.68	Carbonate content	0.50	Low strength	1.00
Miamian	Severe		Low		Severe	
	Water erosion	0.93			Low strength	1.00
HwE2:						
Hennepin	Moderate		Moderate		Severe	
	Water erosion	0.36	Carbonate content	0.50	Low strength	1.00
Wynn	Moderate		Low		Severe	
	Water erosion	0.52			Low strength	1.00
HwF2:						
Hennepin	Severe		Moderate		Severe	
	Water erosion	0.68	Carbonate content	0.50	Low strength	1.00
Wynn	Severe		Low		Severe	
	Water erosion	0.93			Low strength	1.00
KeC2:						
Kendallville	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
Eldean	Slight		Moderate		Severe	
	Water erosion	0.22	Carbonate content	0.50	Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Erosion hazard: Value	Seedling mortality: Rating class and limiting features	Seedling mortality: Value	Soil rutting hazard: Rating class and limiting features	Soil rutting hazard: Value
KeD2:						
Kendallville	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
Eldean	Moderate		Moderate		Severe	
	Water erosion	0.37	Carbonate content	0.50	Low strength	1.00
KnA, KoA:						
Kokomo	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
LeB:						
Lewisburg	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
Celina	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
LfB2:						
Lewisburg	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
Celina	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
LgC3:						
Lewisburg	Slight		High		Severe	
	Water erosion	0.22	Wetness	1.00	Low strength	1.00
LpA:						
Lippincott	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MaA:						
Medway	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
MbB2:						
Miami	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
McE2:						
Miami	Moderate		Low		Severe	
	Water erosion	0.54			Low strength	1.00
Kendallville	Moderate		Low		Severe	
	Water erosion	0.54			Low strength	1.00
McF2:						
Miami	Severe		Low		Severe	
	Water erosion	0.91			Low strength	1.00
Kendallville	Severe		Low		Severe	
	Water erosion	0.91			Low strength	1.00
MdC2:						
Miami	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MdD2:						
Miami	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
MeC, MeC2:						
Miamian	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
MeD2:						
Miamian	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
MfB, MfB2:						
Miamian	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Celina	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MgE2:						
Miamian	Moderate		Low		Severe	
	Water erosion	0.54			Low strength	1.00
Kendallville	Moderate		Low		Severe	
	Water erosion	0.54			Low strength	1.00
MgF2:						
Miamian	Severe		Low		Severe	
	Water erosion	0.91			Low strength	1.00
Kendallville	Severe		Low		Severe	
	Water erosion	0.91			Low strength	1.00
MhC3:						
Miamian	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
Losantville	Slight		Low		Severe	
	Water erosion	0.13			Low strength	1.00
MhD3:						
Miamian	Moderate		Low		Severe	
	Water erosion	0.25			Low strength	1.00
Losantville	Moderate		Low		Severe	
	Water erosion	0.25			Low strength	1.00
MmE2:						
Miamian	Moderate		Low		Severe	
	Water erosion	0.54			Low strength	1.00
Hennepin	Moderate		Moderate		Severe	
	Water erosion	0.37	Carbonate content	0.50	Low strength	1.00
MnE3:						
Miamian	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
Hennepin	Moderate		Moderate		Severe	
	Water erosion	0.37	Carbonate content	0.50	Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
MpA, MrA:						
Milford	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MsA, MtA:						
Millsdale	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
MuA:						
Milton	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
MuB:						
Milton	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MuB2:						
Milton	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MuC2:						
Milton	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00
MuD2:						
Milton	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
MuE2:						
Milton	Moderate		Low		Severe	
	Water erosion	0.52			Low strength	1.00
MwA:						
Morningsun	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
MxA:						
Morningsun	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
Xenia	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
MxB, MxB2:						
Morningsun	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Xenia	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
MyA:						
Mahalasville	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
OcA:						
Ockley	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
OcB:						
Ockley----------------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Pg, Pq:						
Pits------------------	Not rated		Not rated		Not rated	
PtB:						
Plattville------------	Slight		Low		Severe	
	Water erosion	0.05			Low strength	1.00
RaA:						
Rainsville------------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
RaB, RaB2:						
Rainsville------------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
RcA:						
Randolph--------------	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
RcB:						
Randolph--------------	Slight		High		Severe	
	Water erosion	0.10	Wetness	1.00	Low strength	1.00
RnE2:						
Rodman----------------	Moderate		Moderate		Severe	
	Water erosion	0.36	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
RnF2:						
Rodman----------------	Severe		Moderate		Severe	
	Water erosion	0.66	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
RoE2:						
Rodman----------------	Moderate		Moderate		Severe	
	Water erosion	0.36	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
Kendallville----------	Moderate		Low		Severe	
	Water erosion	0.52			Low strength	1.00
RoF2:						
Rodman----------------	Severe		Moderate		Severe	
	Water erosion	0.66	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
Kendallville----------	Severe		Low		Severe	
	Water erosion	0.91			Low strength	1.00
RpA:						
Rossburg--------------	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard: Rating class and limiting features	Value	Seedling mortality: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
RuB, RuB2:						
Russell	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Miamian	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
SeA:						
Savona	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
SnA:						
Sloan	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
StA:						
Stonelick	Slight		Moderate		Severe	
	Water erosion	0.01	Carbonate content	0.50	Low strength	1.00
			Soil reaction	0.50		
SvA:						
Sugarvalley	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
SwA:						
Sugarvalley	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
Fincastle	Slight		High		Severe	
	Water erosion	0.02	Wetness	1.00	Low strength	1.00
ThA:						
Thackery	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
ThB:						
Thackery	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Slight		Low		Severe	
	Water erosion	0.01			Low strength	1.00
WnA:						
Westland	Slight		High		Severe	
	Water erosion	0.01	Wetness	1.00	Low strength	1.00
WyB, WyB2:						
Wynn	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00
WyC2:						
Wynn	Slight		Low		Severe	
	Water erosion	0.22			Low strength	1.00

Table 12.—Woodland Management, Part I—Continued

Map symbol and soil name	Erosion hazard		Seedling mortality		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WyD2:						
Wynn----------------	Moderate		Low		Severe	
	Water erosion	0.37			Low strength	1.00
XeA:						
Xenia---------------	Slight		Low		Severe	
	Water erosion	0.02			Low strength	1.00
XeB, XeB2, XfB:						
Xenia---------------	Slight		Low		Severe	
	Water erosion	0.10			Low strength	1.00

Table 12.—Woodland Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA, CeB, CeB2:						
Celina--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
CoA:						
Corwin--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
CtA, CtB:						
Crosby--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Celina--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
CvA:						
Crosby--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Lewisburg-----------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
CyA:						
Cyclone-------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
DaA, DaB:						
Dana----------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
EeA:						
Eel-----------------	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
EgA, EgB, EgB2:						
Eldean--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
EhC3:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
EhD3:						
Eldean	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
EkA, EkB, EkB2:						
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
FcA, FdA:						
Fincastle	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
FmA, FmB, FmB2:						
Fox	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
HeF2:						
Hennepin	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Miamian	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
HwE2:						
Hennepin	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
Wynn	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
HwF2:						
Hennepin	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Wynn	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
KeC2:						
Kendallville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
Eldean	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
KeD2:						
Kendallville--------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
Eldean-------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
KnA, KoA:						
Kokomo-------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
LeB:						
Lewisburg----------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Celina-------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
LfB2:						
Lewisburg----------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
	Stickiness	0.50				
			Low strength	0.50		
Celina-------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
LgC3:						
Lewisburg----------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
	Stickiness	0.50				
			Slope	0.50		
			Low strength	0.50		
LpA:						
Lippincott---------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
MaA:						
Medway-------------	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MbB2:						
Miami--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
McE2:						
Miami----------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
Kendallville---------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
McF2:						
Miami----------------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Kendallville---------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MdC2:						
Miami----------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
MdD2:						
Miami----------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MeC, MeC2:						
Miamian--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
MeD2:						
Miamian--------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
MfB, MfB2:						
Miamian--------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Celina---------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MgE2:						
Miamian--------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50				
Kendallville---------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
MgF2:						
Miamian-------------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Kendallville--------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MhC3:						
Miamian-------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
Losantville---------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
			Depth to saturated zone	0.50		
MhD3:						
Miamian-------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
	Low strength	0.50				
Losantville---------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
			Depth to saturated zone	0.50		
MmE2, MnE3:						
Miamian-------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
	Stickiness	0.50				
Hennepin------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
MpA, MrA:						
Milford-------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
MsA, MtA:						
Millsdale-----------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
	Depth to bedrock	0.50	Depth to saturated zone	1.00		
			Low strength	0.50		

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuA, MuB:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Depth to bedrock	0.50				
MuB2:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
	Stickiness	0.50				
	Depth to bedrock	0.50				
MuC2:						
Milton	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
	Stickiness	0.50	Low strength	0.50		
	Depth to bedrock	0.50				
MuD2:						
Milton	Severe		Poorly suited		Moderately suited	
	Depth to bedrock	1.00	Slope	1.00	Low strength	0.50
	Slope	0.50	Low strength	0.50		
	Stickiness	0.50				
	Low strength	0.50				
MuE2:						
Milton	Severe		Poorly suited		Moderately suited	
	Depth to bedrock	1.00	Slope	1.00	Low strength	0.50
	Slope	0.50	Low strength	0.50	Slope	0.50
	Low strength	0.50				
	Stickiness	0.50				
MwA:						
Morningsun	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MxA, MxB, MxB2:						
Morningsun	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
MyA:						
Mahalasville	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
OcA, OcB:						
Ockley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
RaA, RaB, RaB2:						
Rainsville----------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RcA, RcB:						
Randolph------------	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	1.00	Low strength	0.50
	Depth to bedrock	0.50	Low strength	0.50		
RnE2:						
Rodman--------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Too sandy	0.50	Low strength	0.50	Slope	0.50
RnF2:						
Rodman--------------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Low strength	0.50	Low strength	0.50
RoE2:						
Rodman--------------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Too sandy	0.50	Low strength	0.50	Slope	0.50
Kendallville--------	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50	Slope	0.50
RoF2:						
Rodman--------------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Low strength	0.50	Low strength	0.50
Kendallville--------	Severe		Poorly suited		Poorly suited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	0.50	Low strength	0.50	Low strength	0.50
RpA:						
Rossburg------------	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
RuB:						
Russell-------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Miamian-------------	Slight		Moderately suited		Moderately suited	
			Low strength	0.50	Low strength	0.50
RuB2:						
Russell-------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Miamian-------------	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for roads (natural surface)		Harvest equipment operability	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SeA:						
Savona	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
SnA:						
Sloan	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Ponding	1.00	Low strength	0.50
	Low strength	0.50	Flooding	1.00		
			Depth to saturated zone	1.00		
			Low strength	0.50		
StA:						
Stonelick	Severe		Poorly suited		Moderately suited	
	Flooding	1.00	Flooding	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
SvA:						
Sugarvalley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
SwA:						
Sugarvalley	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
Fincastle	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Depth to saturated zone	0.50	Low strength	0.50
			Low strength	0.50		
ThA:						
Thackery	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
			Depth to saturated zone	0.50		
ThB:						
Thackery	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 12.—Woodland Management, Part II—Continued

Map symbol and soil name	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value	Harvest equipment operability: Rating class and limiting features	Value
WnA:						
Westland	Moderate		Poorly suited		Moderately suited	
	Low strength	0.50	Ponding	1.00	Low strength	0.50
			Depth to saturated zone	1.00		
			Low strength	0.50		
WyB, WyB2:						
Wynn	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50
WyC2:						
Wynn	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Slope	0.50	Low strength	0.50
			Low strength	0.50		
WyD2:						
Wynn	Moderate		Poorly suited		Moderately suited	
	Slope	0.50	Slope	1.00	Low strength	0.50
	Low strength	0.50	Low strength	0.50		
XeA, XeB, XeB2, XfB:						
Xenia	Moderate		Moderately suited		Moderately suited	
	Low strength	0.50	Low strength	0.50	Low strength	0.50

Table 12.—Woodland Management, Part III

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA, CeB:						
Celina	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
CeB2:						
Celina	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
CoA:						
Corwin	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
CtA, CtB:						
Crosby	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
Celina	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
CvA:						
Crosby	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
Lewisburg	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
CyA:						
Cyclone	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
DaA, DaB:						
Dana	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
EeA:						
Eel	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
EgA, EgB:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.30
	Rock fragment content	0.31				

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EgB2:						
Eldean	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.50
	Rock fragment content	0.31				
EhC3:						
Eldean	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.31				
EhD3:						
Eldean	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Rock fragment content	0.31				
EkA:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
	Rock fragment content	0.22				
EkB:						
Eldean	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
EkB2:						
Eldean	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.22				
FcA, FdA:						
Fincastle	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
FmA, FmB:						
Fox	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
FmB2:						
Fox	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
HeF2:						
Hennepin	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	1.00
	Stickiness	0.50				
Miamian	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	1.00
	Stickiness	0.50				

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
HwE2:						
Hennepin	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Wynn	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50				
HwF2:						
Hennepin	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	1.00
	Stickiness	0.50				
Wynn	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	1.00
	Stickiness	0.50				
KeC2:						
Kendallville	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.28				
Eldean	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Stickiness	0.50				
KeD2:						
Kendallville	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Rock fragment content	0.28				
Eldean	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
KnA:						
Kokomo	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
KoA:						
Kokomo	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
LeB:						
Lewisburg	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
Celina	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
LfB2:						
Lewisburg----------	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
Celina-------------	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
LgC3:						
Lewisburg----------	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/surface depth/rock fragments	0.50
	Slope	0.50				
LpA:						
Lippincott---------	Well suited		Well suited		Low	
					Texture/rock fragments	0.30
MaA:						
Medway-------------	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
MbB2:						
Miami--------------	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
McE2:						
Miami--------------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
Kendallville-------	Poorly suited		Poorly suited		Low	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.01
	Rock fragment content	0.05				
McF2:						
Miami--------------	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	1.00
Kendallville-------	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	0.50
MdC2:						
Miami--------------	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
MdD2:						
Miami--------------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MeC:						
Miamian	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
	Slope	0.50				
MeC2:						
Miamian	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/rock fragments	0.50
	Stickiness	0.50				
MeD2:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50				
MfB:						
Miamian	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
Celina	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
MfB2:						
Miamian	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Celina	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
MgE2:						
Miamian	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Kendallville	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Rock fragment content	0.05				
MgF2:						
Miamian	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/ rock fragments	0.70
	Stickiness	0.50				
Kendallville	Unsuited		Unsuited		High	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	1.00
	Rock fragment content	0.05				
MhC3:						
Miamian	Moderately suited		Well suited		Moderate	
	Slope	0.50			Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
MhC3:						
Losantville---------	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.50
	Slope	0.50				
MhD3:						
Miamian-------------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Losantville---------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
MmE2, MnE3:						
Miamian-------------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
Hennepin------------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50				
MpA, MrA:						
Milford-------------	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
MsA:						
Millsdale-----------	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MtA:						
Millsdale-----------	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.30
MuA, MuB:						
Milton--------------	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MuB2:						
Milton--------------	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.50
MuC2:						
Milton--------------	Moderately suited		Poorly suited		Moderate	
	Stickiness	0.50	Stickiness	0.50	Texture/surface depth/rock fragments	0.50
	Slope	0.50				

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuD2:						
Milton	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50	Stickiness	0.50		
MuE2:						
Milton	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/surface depth/rock fragments	0.50
	Stickiness	0.50	Stickiness	0.50		
MwA:						
Morningsun	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
MxA, MxB:						
Morningsun	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
MxB2:						
Morningsun	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
Xenia	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
MyA:						
Mahalasville	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
OcA, OcB:						
Ockley	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
RaA, RaB:						
Rainsville	Well suited		Well suited		Low	
					Texture/rock fragments	0.01

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
RaB2:						
Rainsville----------	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
RcA, RcB:						
Randolph------------	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01
RnE2:						
Rodman--------------	Poorly suited		Poorly suited		Low	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.01
	Rock fragment content	0.25	Rock fragment content	0.50		
RnF2:						
Rodman--------------	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	0.50
	Rock fragment content	0.69	Rock fragment content	0.50		
RoE2:						
Rodman--------------	Poorly suited		Poorly suited		Low	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.01
	Rock fragment content	0.69	Rock fragment content	0.50		
Kendallville--------	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
RoF2:						
Rodman--------------	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/ surface depth/ rock fragments	0.50
	Rock fragment content	0.69	Rock fragment content	0.50		
Kendallville--------	Unsuited		Unsuited		Moderate	
	Slope	1.00	Slope	1.00	Texture/slope/ rock fragments	0.70
	Rock fragment content	0.05				
RpA:						
Rossburg------------	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
RuB:						
Russell-------------	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Miamian-------------	Moderately suited		Poorly suited		Low	
	Stickiness	0.50	Stickiness	0.50	Texture/rock fragments	0.01

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for site preparation: Rating class and limiting features	Value	Potential for damage to soil by fire: Rating class and limiting features	Value
RuB2:						
Russell	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
Miamian	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/surface depth/rock fragments	0.50
SeA:						
Savona	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
	Rock fragment content	0.14				
SnA:						
Sloan	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
StA:						
Stonelick	Well suited		Well suited		Moderate	
					Texture/rock fragments	0.50
SvA:						
Sugarvalley	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
SwA:						
Sugarvalley	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Fincastle	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
ThA, ThB:						
Thackery	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Well suited		Well suited		Low	
					Texture/rock fragments	0.01
WnA:						
Westland	Well suited		Well suited		Low	
					Texture/rock fragments	0.01

Table 12.—Woodland Management, Part III—Continued

Map symbol and soil name	Suitability for mechanical planting		Suitability for site preparation		Potential for damage to soil by fire	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WyB:						
Wynn	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
WyB2:						
Wynn	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
WyC2:						
Wynn	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
	Slope	0.50				
WyD2:						
Wynn	Poorly suited		Poorly suited		Moderate	
	Slope	0.75	Slope	0.75	Texture/rock fragments	0.50
	Stickiness	0.50				
XeA, XeB:						
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01
XeB2:						
Xenia	Moderately suited		Well suited		Moderate	
	Stickiness	0.50			Texture/rock fragments	0.50
XfB:						
Xenia	Moderately suited		Well suited		Low	
	Stickiness	0.50			Texture/rock fragments	0.01

Table 13.—Woodland Productivity

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
CeA, CeB, CeB2:				
Celina	black cherry	---	---	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	110	129	
	white ash	---	---	
	white oak	---	---	
	northern red oak	90	72	
CoA:				
Corwin	black cherry	---	---	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	100	129	
	white ash	---	---	
	white oak	---	---	
	northern red oak	86	72	
CtA, CtB:				
Crosby	black oak	88	72	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	tuliptree	94	100	
	white ash	87	86	
	northern red oak	86	72	
Celina	black cherry	---	---	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	110	129	
	white ash	---	---	
	white oak	---	---	
	northern red oak	90	72	
CvA:				
Crosby	black oak	88	72	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	tuliptree	94	100	
	white ash	87	86	
	northern red oak	86	72	
Lewisburg	black cherry	---	---	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	100	129	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
CyA:				
Cyclone	white oak	75	57	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	pin oak	90	72	
DaA, DaB:				
Dana	tuliptree	98	100	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	white oak	90	72	
EeA:				
Eel	black walnut	---	---	black locust, black walnut, eastern white pine, tuliptree
	eastern cottonwood	---	---	
	tuliptree	108	114	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
EgA, EgB, EgB2:				
Eldean	black cherry	---	---	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	80	57	
	northern red oak	80	57	
EhC3, EhD3:				
Eldean	black cherry	---	---	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	70	55	
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	70	55	
	northern red oak	70	55	
EkA, EkB, EkB2:				
Eldean	black cherry	---	---	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	80	57	
	northern red oak	80	57	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
FcA, FdA:				
Fincastle	pin oak	85	72	American sycamore, baldcypress, eastern white pine, red maple, sweetgum, tuliptree, white ash
	tuliptree	85	86	
	white oak	75	57	
	northern red oak	75	57	
FmA, FmB, FmB2:				
Fox	black cherry	---	---	black locust, chinkapin oak, eastern white pine, northern red oak, tuliptree, white ash, white oak
	sugar maple	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
HeF2:				
Hennepin	black cherry	---	---	Norway spruce, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
HwE2, HwF2:				
Hennepin	black cherry	---	---	Norway spruce, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	---	
	tuliptree	95	100	
	black walnut	---	---	
	white ash	---	---	
	sugar maple	---	---	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
KeC2, KeD2:				
Kendallville	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	95	100	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
Eldean	black cherry	---	---	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	black oak	80	57	
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	80	57	
	northern red oak	80	57	
KnA, KoA:				
Kokomo	pin oak	85	72	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	sweetgum	90	100	
	white oak	75	57	
	northern red oak	75	57	
LeB, LfB2:				
Lewisburg	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
	northern red oak	80	57	
Celina	black cherry	---	---	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	110	129	
	white ash	---	---	
	white oak	---	---	
	northern red oak	90	72	
LgC3:				
Lewisburg	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
	northern red oak	75	55	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
LpA:				
Lippincott	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	black oak	80	57	
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	88	72	
	red maple	---	---	
	swamp white oak	85	72	
	northern red oak	80	57	
MaA:				
Medway	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	96	100	
	white ash	---	---	
	white oak	---	---	
	northern red oak	86	72	
MbB2:				
Miami	white oak	90	72	Shumard oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
McE2, McF2:				
Miami	white oak	90	72	Shumard oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	
Kendallville	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	95	100	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
MdC2, MdD2:				
Miami	white oak	90	72	Shumard oak, black cherry, black walnut, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	sweetgum	76	72	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
MeC, MeC2, MeD2:				
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
MfB, MfB2:				
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
Celina	black cherry	---	---	Norway spruce, black walnut, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	northern red oak	90	72	
	sugar maple	---	---	
	tuliptree	110	129	
	white ash	---	---	
	white oak	---	---	
MgE2, MgF2:				
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
Kendallville	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	95	100	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
MhC3, MhD3:				
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
MhC3, MhD3:				
Losantville	black cherry	---	---	American sycamore, black cherry, black locust, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	75	57	
	northern red oak	80	57	
MmE2:				
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
Hennepin	black cherry	---	---	Norway spruce, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
MnE3:				
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
Hennepin	black cherry	---	---	Norway spruce, eastern white pine, northern red oak, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
MpA, MrA:				
Milford	pin oak	85	72	Norway spruce, baldcypress, eastern white pine, red maple, sweetgum, white ash
	sweetgum	90	100	
	white oak	75	57	
	northern red oak	75	57	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
MsA, MtA:				
Millsdale	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	pin oak	86	72	
MuA, MuB, MuB2, MuC2, MuD2, MuE2:				
Milton	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	95	100	
	white ash	---	---	
	white oak	---	---	
	northern red oak	80	57	
MwA:				
Morningsun	green ash	---	---	Scotch pine, black walnut, eastern white pine, green ash, northern red oak, red pine, white oak
	northern red oak	---	---	
	white oak	86	72	
MxA, MxB, MxB2:				
Morningsun	green ash	---	---	Scotch pine, black walnut, eastern white pine, green ash, northern red oak, red pine, white oak
	northern red oak	---	---	
	white oak	86	72	
Xenia	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	white oak	90	72	
MyA:				
Mahalasville	pin oak	85	72	blackgum, bur oak, green ash, pin oak, red maple, shellbark hickory, silver maple, swamp white oak, tamarack
	white oak	75	57	
OcA, OcB:				
Ockley	tuliptree	98	100	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	northern red oak	90	72	
	white oak	90	72	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
Pg, Pq. Pits				
PtB:				
Plattville	black cherry	---	---	American sycamore, black oak, eastern white pine, green ash, northern red oak, red maple, river birch, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	100	129	
	white ash	---	---	
	white oak	---	---	
	northern red oak	86	72	
RaA, RaB, RaB2:				
Rainsville	northern red oak	90	72	bur oak, eastern white pine, green ash, northern red oak, tuliptree, white ash, white oak
	tuliptree	98	100	
	white oak	88	72	
	shagbark hickory	---	---	
RcA, RcB:				
Randolph	sugar maple	90	57	American sycamore, baldcypress, eastern cottonwood, eastern white pine, green ash, pin oak, red maple, swamp white oak, sweetgum, tuliptree
	tuliptree	85	86	
	northern red oak	75	57	
RnE2, RnF2:				
Rodman	eastern white pine	85	200	eastern white pine, jack pine, red pine
	red pine	75	143	
	white oak	70	57	
	northern red oak	70	57	
RoE2, RoF2:				
Rodman	eastern white pine	85	200	eastern white pine, jack pine, red pine
	red pine	75	143	
	northern red oak	70	57	
	white oak	70	57	
Kendallville	black cherry	---	---	black walnut, eastern white pine, northern red oak, red pine, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	95	100	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
RpA:				
Rossburg	tuliptree	---	---	black walnut, northern red oak, tuliptree, white oak
	northern red oak	86	72	
	white oak	90	75	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
RuB, RuB2:				
Russell	northern red oak	90	72	black cherry, black locust, black walnut, eastern white pine, green ash, northern red oak, red pine, sweetgum, tuliptree, white ash, white oak
	white oak	90	72	
	tuliptree	98	100	
Miamian	black cherry	---	---	Norway spruce, chinkapin oak, eastern white pine, northern red oak, shagbark hickory, sugar maple, tuliptree, white ash, white oak
	black walnut	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	northern red oak	87	72	
SeA:				
Savona	black cherry	---	---	American sycamore, black cherry, black locust, eastern cottonwood, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	northern red oak	---	---	
	sugar maple	---	---	
	tuliptree	---	---	
	white ash	---	---	
	white oak	---	---	
	pin oak	80	57	
SnA:				
Sloan	eastern cottonwood	---	---	American sycamore, eastern cottonwood, green ash, pin oak, red maple, silver maple, swamp white oak, sweetgum
	green ash	---	---	
	red maple	---	---	
	swamp white oak	---	---	
	pin oak	86	72	
StA:				
Stonelick	American sycamore	---	---	American sycamore, black walnut, bur oak, eastern cottonwood, green ash, tuliptree
	eastern cottonwood	---	---	
	green ash	---	---	
	swamp white oak	---	---	
	sweetgum	---	---	
	tuliptree	95	100	
	pin oak	86	72	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SvA:				
Sugarvalley	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, red pine, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	---	---	
	red maple	---	---	
	sugar maple	90	57	
	swamp white oak	---	---	
	tuliptree	86	86	
	northern red oak	76	57	
SwA:				
Sugarvalley	black cherry	---	---	American sycamore, baldcypress, eastern cottonwood, green ash, pin oak, red maple, red pine, silver maple, swamp white oak, sweetgum
	eastern cottonwood	---	---	
	green ash	---	---	
	pin oak	---	---	
	red maple	---	---	
	sugar maple	90	57	
	swamp white oak	---	---	
	tuliptree	86	86	
	northern red oak	76	57	
Fincastle	northern red oak	75	57	American sycamore, baldcypress, bur oak, green ash, red maple, sweetgum, tuliptree, white ash
	pin oak	85	72	
	white oak	75	57	
	sweetgum	80	86	
	tuliptree	85	86	
ThA, ThB:				
Thackery	northern red oak	90	72	black cherry, black locust, black walnut, eastern white pine, green ash, northern red oak, red pine, tuliptree, white ash, white oak
	white oak	90	72	
	black cherry	---	---	
	tuliptree	98	100	
	black walnut	---	---	
	white ash	---	---	
	sugar maple	---	---	
Ud.				
Udorthents				
W.				
Water				
WbA:				
Warsaw	northern red oak	80	57	black locust, chinkapin oak, eastern white pine, northern red oak, tuliptree, white ash, white oak
	white oak	75	57	
	black cherry	---	---	
	white ash	---	---	
	sugar maple	---	---	

Table 13.—Woodland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
WnA:				
Westland	pin oak	85	72	American sycamore, baldcypress, bur oak, eastern cottonwood, green ash, pin oak, red maple, swamp white oak, sweetgum, white ash
	white oak	75	57	
	sweetgum	90	100	
WyB, WyB2, WyC2, WyD2:				
Wynn	northern red oak	85	72	black walnut, eastern white pine, red pine, tuliptree, white ash, white oak
	white oak	85	72	
	black cherry	---	---	
	tuliptree	95	100	
	black walnut	---	---	
	white ash	---	---	
	sugar maple	---	---	
XeA, XeB, XeB2, XfB:				
Xenia	white oak	90	72	black walnut, eastern white pine, red pine, sweetgum, tuliptree, white ash
	tuliptree	98	100	

Table 14.—Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
CeA, CeB, CeB2:					
Celina------------	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CoA:					
Corwin------------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
CtA, CtB:					
Crosby------------	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine	pin oak
Celina------------	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CvA:					
Crosby------------	American cranberrybush	southern arrowwood	Austrian pine; eastern redcedar; green ash; osageorange; Washington hawthorn	eastern white pine	pin oak
Lewisburg---------	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
CyA:					
Cyclone-----------	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern whitecedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
DaA, DaB:					
Dana	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
EeA:					
Eel	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
EgA, EgB, EgB2, EhC3, EhD3, EkA, EkB, EkB2:					
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
FcA, FdA:					
Fincastle	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
FmA, FmB, FmB2:					
Fox	common lilac; Siberian peashrub	American hazelnut; eastern redcedar; radiant crabapple; southern arrowwood; Washington hawthorn	American plum; Austrian pine; eastern white pine; serviceberry; Virginia pine	---	---
HeF2:					
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
HwE2, HwF2:					
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
HwE2, HwF2:					
Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
KeC2, KeD2:					
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Eldean	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
KnA, KoA:					
Kokomo	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern whitecedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
LeB, LfB2:					
Lewisburg	Siberian peashrub	eastern redcedar; jack pine; osageorange; Russian-olive; Washington hawthorn	honeylocust; northern catalpa	---	---
Celina	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
LgC3:					
Lewisburg	Siberian peashrub	eastern redcedar; jack pine; osageorange; Russian-olive; Washington hawthorn	honeylocust; northern catalpa	---	---
LpA:					
Lippincott	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern whitecedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
MaA:					
Medway------------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MbB2:					
Miami-------------	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
McE2, McF2:					
Miami-------------	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
Kendallville------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MdC2, MdD2:					
Miami-------------	American cranberrybush; common juniper; coralberry; gray dogwood; silky dogwood	blackhaw; hazelnut; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood; staghorn sumac	American plum; eastern redcedar; northern white-cedar; serviceberry; Washington hawthorn	black oak; blackgum; common hackberry; green ash; Norway spruce; Virginia pine	eastern cottonwood; eastern white pine; imperial Carolina poplar
MeC, MeC2, MeD2:					
Miamian-----------	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern whitecedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
MfB, MfB2:					
Miamian-----------	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern whitecedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Celina------------	silky dogwood	American cranberrybush	American witchhazel; blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
MgE2, MgF2:					
Miamian-----------	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern whitecedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Kendallville------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MhC3, MhD3:					
Miamian-----------	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern whitecedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
Losantville-------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MmE2, MnE3:					
Miamian-----------	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern whitecedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
MmE2, MnE3:					
Hennepin	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; northern white-cedar; serviceberry; Washington hawthorn	Austrian pine; Norway spruce	eastern white pine
MpA, MrA:					
Milford	American elder; black chokeberry; buttonbush; common winterberry; gray dogwood; highbush blueberry; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	green hawthorn; hackberry; northern whitecedar; shingle oak	blackgum; Norway spruce; river birch; swamp white oak; sweetgum	eastern cottonwood; green ash; imperial Carolina poplar; pin oak; red maple
MsA, MtA:					
Millsdale	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern whitecedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	---
MuA, MuB, MuB2, MuC2, MuD2, MuE2:					
Milton	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
MwA:					
Morningsun	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
MxA, MxB, MxB2:					
Morningsun	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Xenia	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
MyA:					
Mahalasville------	American elder; black chokeberry; buttonbush; gray dogwood; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	green hawthorn; hackberry; northern whitecedar; shingle oak	blackgum; bur oak; green ash; Norway spruce; pin oak; swamp white oak	eastern cottonwood; imperial Carolina poplar; red maple; river birch; silver maple
OcA, OcB:					
Ockley------------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Pg, Pq.					
Pits					
PtB:					
Plattville--------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RaA, RaB, RaB2:					
Rainsville--------	American elder; black chokeberry; common juniper; common winterberry; coralberry; gray dogwood; highbush cranberry; ninebark; redosier dogwood; silky dogwood; spicebush	arrowwood; blackhaw; hazelnut; nannyberry; roughleaf dogwood; shining sumac; smooth sumac; staghorn sumac; wild sweet crab; witchhazel	American plum; common persimmon; eastern redcedar; hackberry; northern whitecedar; pecan; prairie crabapple; serviceberry; Washington hawthorn	black cherry; black walnut; blackgum; green ash; northern red oak; Norway spruce; pin oak; red pine; tuliptree; white oak; baldcypress	eastern cottonwood; eastern white pine; imperial Carolina poplar; cherrybark oak
RcA, RcB:					
Randolph----------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RnE2, RnF2:					
Rodman------------	gray dogwood; Siberian peashrub; silky dogwood	eastern redcedar; radiant crabapple; Washington hawthorn	black locust; jack pine; Virginia pine	---	---

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
RoE2, RoF2:					
Rodman	gray dogwood; Siberian peashrub; silky dogwood	eastern redcedar; radiant crabapple; Washington hawthorn	black locust; jack pine; Virginia pine	---	---
Kendallville	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RpA:					
Rossburg	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	blue spruce; northern white-cedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
RuB, RuB2:					
Russell	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Miamian	silky dogwood	American cranberrybush; American hazelnut; southern arrowwood	American plum; blue spruce; northern whitecedar; serviceberry; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine
SeA:					
Savona	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
SnA:					
Sloan	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern whitecedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
StA:					
Stonelick	silky dogwood	Siberian peashrub	blue spruce; eastern redcedar; nannyberry; osageorange; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
SvA:					
Sugarvalley	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
SwA:					
Sugarvalley	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Fincastle	silky dogwood	American cranberrybush; redosier dogwood	American witchhazel; blue spruce; nannyberry; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
ThA, ThB:					
Thackery	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak
Ud. Udorthents					
W. Water					
WbA:					
Warsaw	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---
WnA:					
Westland	silky dogwood	American cranberrybush	Austrian pine; blue spruce; northern whitecedar; Washington hawthorn; white fir	eastern white pine; Norway spruce	pin oak
WyB, WyB2, WyC2, WyD2:					
Wynn	common lilac; Siberian peashrub	eastern redcedar; radiant crabapple; Washington hawthorn	Austrian pine; eastern white pine; jack pine; red pine	---	---

Table 14.—Windbreaks and Environmental Plantings—Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
XeA, XeB, XeB2, XfB:					
Xenia------------	silky dogwood	American cranberrybush	blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	eastern white pine; pin oak

Table 15.—Recreation, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
CeB, CeB2:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
CoA:						
Corwin	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
	Depth to saturated zone	0.47	Depth to saturated zone	0.21	Depth to saturated zone	0.47
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Depth to saturated zone	0.10
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
					Slope	0.13
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.13
					Depth to saturated zone	0.10

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
CvA:						
Crosby-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.98	Restricted permeability	0.98	Restricted permeability	0.98
Lewisburg----------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Restricted permeability	0.96
CyA:						
Cyclone------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
DaA:						
Dana---------------	Not limited		Not limited		Not limited	
DaB:						
Dana---------------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
EeA:						
Eel----------------	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.46	Depth to saturated zone	0.83
	Depth to saturated zone	0.83			Flooding	0.60
EgA:						
Eldean-------------	Somewhat limited		Somewhat limited		Very limited	
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Content of large stones	0.01
EgB, EgB2:						
Eldean-------------	Somewhat limited		Somewhat limited		Very limited	
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Slope	0.50
					Content of large stones	0.01
EhC3:						
Eldean-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Content of large stones	0.01
EhD3:						
Eldean-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Gravel content	0.04	Gravel content	0.04	Gravel content	1.00
					Content of large stones	0.01

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
EkA:						
Eldean	Not limited		Not limited		Not limited	
EkB, EkB2:						
Eldean	Not limited		Not limited		Somewhat limited	
					Slope	0.50
FcA, FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
FmA:						
Fox	Not limited		Not limited		Not limited	
FmB, FmB2:						
Fox	Not limited		Not limited		Somewhat limited	
					Slope	0.50
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.46
					Restricted permeability	0.21
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.90
					Restricted permeability	0.21

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
KeC2:						
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.21
Eldean--------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
KeD2:						
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
Eldean--------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
KnA, KoA:						
Kokomo--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
LeB, LfB2:						
Lewisburg-----------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Restricted permeability	0.96
					Slope	0.50
Celina--------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
LgC3:						
Lewisburg-----------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.96	Depth to saturated zone	1.00
	Restricted permeability	0.96	Depth to saturated zone	0.79	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
LpA:						
Lippincott----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
MaA:						
Medway--------------	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MbB2:						
Miami---------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
					Slope	0.55
McE2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
McF2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MdC2:						
Miami---------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	1.00
MdD2:						
Miami---------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
	Slope	0.99	Slope	0.99	Restricted permeability	1.00
MeC, MeC2:						
Miamian-------------	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
MeD2:						
Miamian-------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
MfB, MfB2:						
Miamian-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
MfB, MfB2:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.10	Depth to saturated zone	0.05	Slope	0.50
					Depth to saturated zone	0.10
MgE2, MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Slope	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.96
Losantville	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Restricted permeability	0.98	Slope	1.00
	Restricted permeability	0.98	Depth to saturated zone	0.76	Depth to saturated zone	1.00
	Slope	0.16	Slope	0.16	Restricted permeability	0.98
MhD3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Losantville	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Slope	0.99	Slope	1.00
	Slope	0.99	Restricted permeability	0.98	Depth to saturated zone	1.00
	Restricted permeability	0.98	Depth to saturated zone	0.76	Restricted permeability	0.98
MmE2, MnE3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MpA, MrA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MsA, MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
MuA:						
Milton	Not limited		Not limited		Not limited	
MuB, MuB2:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
					Slope	0.50
MuC2:						
Milton	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.16	Slope	0.16	Slope	1.00
					Depth to bedrock	0.65
MuD2:						
Milton	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
					Depth to bedrock	0.54
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to bedrock	0.95
MwA:						
Morningsun	Not limited		Not limited		Not limited	
MxA:						
Morningsun	Not limited		Not limited		Not limited	
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Depth to saturated zone	0.47
	Restricted permeability	0.21	Depth to saturated zone	0.21	Restricted permeability	0.21
MxB, MxB2:						
Morningsun	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
	Restricted permeability	0.21	Depth to saturated zone	0.21	Depth to saturated zone	0.47
					Restricted permeability	0.21

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MyA:						
Mahalasville--------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
OcA:						
Ockley--------------	Not limited		Not limited		Not limited	
OcB:						
Ockley--------------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Pg, Pq:						
Pits----------------	Not rated		Not rated		Not rated	
PtB:						
Plattville----------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
RaA:						
Rainsville----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
RaB:						
Rainsville----------	Not limited		Not limited		Somewhat limited	
					Slope	0.55
RaB2:						
Rainsville----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.55
					Restricted permeability	0.21
RcA:						
Randolph------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
RcB:						
Randolph------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	0.50
					Depth to bedrock	0.29
					Restricted permeability	0.21
RnE2, RnF2:						
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.07	Gravel content	0.07	Gravel content	1.00

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoE2, RoF2:						
Rodman-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Gravel content	0.07	Gravel content	0.07	Gravel content	1.00
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
RpA:						
Rossburg-----------	Very limited		Not limited		Somewhat limited	
	Flooding	1.00			Flooding	0.60
RuB, RuB2:						
Russell------------	Not limited		Not limited		Somewhat limited	
					Slope	0.50
Miamian------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.96	Restricted permeability	0.96	Restricted permeability	0.96
					Slope	0.50
SeA:						
Savona-------------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.79	Depth to saturated zone	1.00
SnA:						
Sloan--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Ponding	1.00	Flooding	1.00
	Ponding	1.00	Flooding	0.40	Ponding	1.00
StA:						
Stonelick----------	Very limited		Somewhat limited		Very limited	
	Flooding	1.00	Flooding	0.40	Flooding	1.00
SvA:						
Sugarvalley---------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.79	Depth to saturated zone	1.00
SwA:						
Sugarvalley---------	Very limited		Somewhat limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.79	Depth to saturated zone	1.00
Fincastle----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ThA:						
Thackery-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	0.50	Depth to saturated zone	0.87
ThB:						
Thackery-----------	Not limited		Not limited		Somewhat limited	
					Slope	0.50

Table 15.—Recreation, Part I—Continued

Map symbol and soil name	Camp areas		Picnic areas		Playgrounds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Not limited		Not limited		Not limited	
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Slope	0.50
					Restricted permeability	0.43
					Depth to bedrock	0.35
WyB2:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.43	Restricted permeability	0.43	Depth to bedrock	0.65
					Slope	0.50
					Restricted permeability	0.43
WyC2:						
Wynn	Somewhat limited		Somewhat limited		Very limited	
	Restricted permeability	0.21	Restricted permeability	0.21	Slope	1.00
					Depth to bedrock	0.95
	Slope	0.16	Slope	0.16	Restricted permeability	0.21
WyD2:						
Wynn	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.99	Slope	0.99	Slope	1.00
	Restricted permeability	0.21	Restricted permeability	0.21	Depth to bedrock	0.65
					Restricted permeability	0.21
XeA:						
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Depth to saturated zone	0.47
	Restricted permeability	0.21	Depth to saturated zone	0.21	Restricted permeability	0.21
XeB, XeB2, XfB:						
Xenia	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.47	Restricted permeability	0.21	Slope	0.50
					Depth to saturated zone	0.47
	Restricted permeability	0.21	Depth to saturated zone	0.21	Restricted permeability	0.21

Table 15.—Recreation, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
CeA, CeB, CeB2:						
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CoA:						
Corwin	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
CtA, CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Lewisburg	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
DaA, DaB:						
Dana	Not limited		Not limited		Not limited	
EeA:						
Eel	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.08	Depth to saturated zone	0.08	Flooding	0.60
					Depth to saturated zone	0.43
EgA, EgB:						
Eldean	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Gravel content	0.04
					Droughty	0.02
					Content of large stones	0.01

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
EgB2:						
Eldean----------------	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Droughty	0.13
					Gravel content	0.04
					Content of large stones	0.01
EhC3:						
Eldean----------------	Not limited		Not limited		Very limited	
					Carbonate content	1.00
					Droughty	0.28
					Slope	0.04
					Gravel content	0.04
					Content of large stones	0.01
EhD3:						
Eldean----------------	Somewhat limited		Not limited		Very limited	
	Slope	0.11			Carbonate content	1.00
					Slope	1.00
					Gravel content	0.04
					Content of large stones	0.01
EkA, EkB, EkB2:						
Eldean----------------	Not limited		Not limited		Very limited	
					Carbonate content	1.00
FcA, FdA:						
Fincastle------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FmA, FmB, FmB2:						
Fox------------------	Not limited		Not limited		Not limited	
HeF2:						
Hennepin------------	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.95	Slope	1.00
Miamian-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.95		
HwE2:						
Hennepin------------	Somewhat limited		Not limited		Very limited	
	Slope	0.85			Slope	1.00
Wynn-----------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.85			Depth to bedrock	0.46
HwF2:						
Hennepin------------	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.95	Slope	1.00
Wynn-----------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.95	Depth to bedrock	0.90

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
KeC2:						
Kendallville--------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
Eldean--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Carbonate content	1.00
					Slope	0.04
					Droughty	0.04
KeD2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11				
Eldean--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Carbonate content	1.00
	Slope	0.11			Slope	1.00
KnA, KoA:						
Kokomo--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
LeB, LfB2:						
Lewisburg-----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
Celina--------------	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
LgC3:						
Lewisburg-----------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.78
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Slope	0.04
LpA:						
Lippincott----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Carbonate content	1.00
					Ponding	1.00
MaA:						
Medway--------------	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
MbB2:						
Miami---------------	Not limited		Not limited		Not limited	
McE2:						
Miami---------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
Kendallville--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
McF2:						
Miami	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
MdC2:						
Miami	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11				
MeC, MeC2:						
Miamian	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.04
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11				
MfB, MfB2:						
Miamian	Not limited		Not limited		Not limited	
Celina	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.03
MgE2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
Kendallville	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
MhC3:						
Miamian	Not limited		Not limited		Somewhat limited	
					Slope	0.04
Losantville	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Depth to saturated zone	0.75
					Droughty	0.49
					Slope	0.04

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MhD3:						
Miamian	Somewhat limited		Not limited		Very limited	
	Slope	0.11			Slope	1.00
Losantville	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.44	Depth to saturated zone	0.44	Slope	1.00
	Slope	0.11			Droughty	0.80
					Depth to saturated zone	0.75
MmE2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.89				
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.89			Slope	1.00
MnE3:						
Miamian	Somewhat limited		Not limited		Very limited	
	Slope	0.89			Slope	1.00
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.89			Slope	1.00
MpA, MrA:						
Milford	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Depth to bedrock	0.84
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
					Depth to bedrock	0.46
MuA:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.35
MuB, MuB2:						
Milton	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
MuC2:						
Milton	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.65
					Slope	0.04

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11			Depth to bedrock	0.54
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.85			Depth to bedrock	0.95
					Droughty	0.08
MwA:						
Morningsun	Not limited		Not limited		Not limited	
MxA, MxB, MxB2:						
Morningsun	Not limited		Not limited		Not limited	
Xenia	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
OcA, OcB:						
Ockley	Not limited		Not limited		Not limited	
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Not limited		Not limited		Not limited	
RaA, RaB, RaB2:						
Rainsville	Not limited		Not limited		Not limited	
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Depth to bedrock	0.20
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Depth to bedrock	0.29
RnE2:						
Rodman	Somewhat limited		Not limited		Very limited	
	Slope	0.85			Slope	1.00
					Droughty	0.99
					Gravel content	0.07

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
RnF2:						
Rodman--------------	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.93	Slope	1.00
					Droughty	0.99
					Gravel content	0.07
RoE2:						
Rodman--------------	Somewhat limited		Not limited		Very limited	
	Slope	0.85			Slope	1.00
					Droughty	0.99
					Gravel content	0.07
Kendallville--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.85				
RoF2:						
Rodman--------------	Very limited		Somewhat limited		Very limited	
	Slope	1.00	Slope	0.93	Slope	1.00
					Droughty	0.99
					Gravel content	0.07
Kendallville--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	1.00	Slope	0.93		
RpA:						
Rossburg------------	Not limited		Not limited		Somewhat limited	
					Flooding	0.60
RuB, RuB2:						
Russell-------------	Not limited		Not limited		Not limited	
Miamian-------------	Not limited		Not limited		Not limited	
SeA:						
Savona--------------	Somewhat limited		Somewhat limited		Very limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Carbonate content	1.00
					Depth to saturated zone	0.78
SnA:						
Sloan---------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Flooding	0.40	Flooding	0.40	Ponding	1.00
StA:						
Stonelick-----------	Somewhat limited		Somewhat limited		Very limited	
	Flooding	0.40	Flooding	0.40	Flooding	1.00
SvA:						
Sugarvalley---------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78

Table 15.—Recreation, Part II—Continued

Map symbol and soil name	Paths and trails		Off-road motorcycle trails		Golf fairways	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SwA:						
Sugarvalley----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.50	Depth to saturated zone	0.50	Depth to saturated zone	0.78
Fincastle-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ThA:						
Thackery------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.11	Depth to saturated zone	0.11	Depth to saturated zone	0.48
ThB:						
Thackery------------	Not limited		Not limited		Not limited	
Ud:						
Udorthents----------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	
WbA:						
Warsaw--------------	Not limited		Not limited		Not limited	
WnA:						
Westland------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn----------------	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.35
WyB2:						
Wynn----------------	Not limited		Not limited		Somewhat limited	
					Depth to bedrock	0.65
WyC2:						
Wynn----------------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Depth to bedrock	0.95
					Slope	0.04
WyD2:						
Wynn----------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Slope	1.00
	Slope	0.11			Depth to bedrock	0.65
XeA, XeB, XeB2, XfB:						
Xenia---------------	Not limited		Not limited		Somewhat limited	
					Depth to saturated zone	0.19

Table 16.—Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
CeA, CeB, CeB2:										
Celina-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CoA:										
Corwin------	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
CtA, CtB:										
Crosby------	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Celina------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CvA:										
Crosby------	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Lewisburg---	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CyA:										
Cyclone-----	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
DaA, DaB:										
Dana--------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EeA:										
Eel---------	Good	Good	Fair	Good	Good	Poor	Poor	Good	Good	Poor.
EgA, EgB, EgB2:										
Eldean-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EhC3, EhD3:										
Eldean------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EkA, EkB, EkB2:										
Eldean-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FcA, FdA:										
Fincastle---	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
FmA, FmB, FmB2:										
Fox--------	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HeF2:										
Hennepin----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Miamian-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

Table 16.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
HwE2, HwF2:										
Hennepin----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Wynn--------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
KeC2:										
Kendallville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Eldean------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
KeD2:										
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Eldean------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
KnA, KoA:										
Kokomo------	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
LeB, LfB2:										
Lewisburg---	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Celina------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
LgC3:										
Lewisburg---	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LpA:										
Lippincott--	Poor	Fair	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
MaA:										
Medway------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MbB2:										
Miami-------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
McE2, McF2:										
Miami-------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MdC2, MdD2:										
Miami-------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MeC, MeC2, MeD2:										
Miamian----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 16.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
MfB, MfB2:										
Miamian-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Celina------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MgE2, MgF2:										
Miamian-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MhC3, MhD3:										
Miamian-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Losantville-	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MmE2, MnE3:										
Miamian-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hennepin----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MpA, MrA:										
Milford-----	Good	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
MsA, MtA:										
Millsdale---	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
MuA, MuB, MuB2:										
Milton-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MuC2, MuD2, MuE2:										
Milton-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MwA:										
Morningsun--	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MxA, MxB, MxB2:										
Morningsun-	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Xenia------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MyA:										
Mahalasville	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
OcA, OcB:										
Ockley------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 16.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Pg, Pq. Pits										
PtB: Plattville--	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
RaA, RaB, RaB2: Rainsville-	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RcA: Randolph----	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
RcB: Randolph----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RnE2, RnF2: Rodman------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
RoE2, RoF2: Rodman------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Kendallville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
RpA: Rossburg----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RuB, RuB2: Russell-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Miamian-----	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SeA: Savona------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
SnA: Sloan-------	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
StA: Stonelick---	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SvA: Sugarvalley-	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
SwA: Sugarvalley-	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Fincastle---	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

Table 16.—Wildlife Habitat—Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
ThA, ThB:										
Thackery----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ud.										
Udorthents										
W.										
Water										
WbA:										
Warsaw------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WnA:										
Westland----	Fair	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
WyB, WyB2, WyC2, WyD2:										
Wynn-------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
XeA, XeB, XeB2, XfB:										
Xenia------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

Table 17.—Construction Materials, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.0. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
CeA, CeB, CeB2:				
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CoA:				
Corwin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CtA, CtB:				
Crosby	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CvA:				
Crosby	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
CyA:				
Cyclone	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
DaA, DaB:				
Dana	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
EeA:				
Eel	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
EgA, EgB, EgB2, EhC3, EhD3, EkA, EkB, EkB2:				
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35

Table 17.—Construction Materials, Part I—Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
FcA, FdA:				
Fincastle	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
FmA, FmB, FmB2:				
Fox	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HeF2:				
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
HwE2, HwF2:				
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Wynn	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
KeC2, KeD2:				
Kendallville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Eldean	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.35
KnA, KoA:				
Kokomo	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LeB, LfB2:				
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LgC3:				
Lewisburg	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
LpA:				
Lippincott	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.39

Table 17.—Construction Materials, Part I—Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
MaA:				
Medway--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MbB2:				
Miami---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
McE2, McF2:				
Miami---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Kendallville--------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MdC2, MdD2:				
Miami---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MeC, MeC2, MeD2:				
Miamian-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MfB, MfB2:				
Miamian-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Celina--------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MgE2, MgF2:				
Miamian-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Kendallville--------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MhC3, MhD3:				
Miamian-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Losantville---------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 17.—Construction Materials, Part I—Continued

Map symbol and soil name	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
MmE2, MnE3:				
Miamian	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Hennepin	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MpA:				
Milford	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MrA:				
Milford	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.89
MsA, MtA:				
Millsdale	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MuA, MuB, MuB2, MuC2, MuD2, MuE2:				
Milton	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MwA:				
Morningsun	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MxA, MxB, MxB2:				
Morningsun	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Xenia	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
MyA:				
Mahalasville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
OcA, OcB:				
Ockley	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.91
Pg, Pq:				
Pits	Not rated		Not rated	
PtB:				
Plattville	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 17.—Construction Materials, Part I—Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
RaA, RaB, RaB2:				
Rainsville----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RcA, RcB:				
Randolph------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RnE2, RnF2:				
Rodman--------------	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
RoE2, RoF2:				
Rodman--------------	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
Kendallville--------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
RpA:				
Rossburg------------	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.50
RuB, RuB2:				
Russell-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Miamian-------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
SeA:				
Savona--------------	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.50
SnA:				
Sloan---------------	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.50
StA:				
Stonelick-----------	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
SvA:				
Sugarvalley---------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 17.—Construction Materials, Part I—Continued

Map symbol and soil name	Potential source of gravel		Potential source of sand	
	Rating class	Value	Rating class	Value
SwA:				
Sugarvalley----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
Fincastle-----------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
ThA, ThB:				
Thackery------------	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.41
Ud:				
Udorthents----------	Not rated		Not rated	
W:				
Water---------------	Not rated		Not rated	
WbA:				
Warsaw--------------	Good		Fair	
	Thickest layer	0.91	Thickest layer	0.50
	Bottom layer	1.00	Bottom layer	0.91
WnA:				
Westland------------	Good		Fair	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	1.00	Bottom layer	0.87
WyB, WyB2, WyC2, WyD2:				
Wynn---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00
XeA, XeB, XeB2, XfB:				
Xenia---------------	Poor		Poor	
	Thickest layer	0.00	Thickest layer	0.00
	Bottom layer	0.00	Bottom layer	0.00

Table 17.—Construction Materials, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
CeA, CeB:						
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.94
	Water erosion	0.99				
CeB2:						
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Hard to reclaim (dense layer)	0.35
	Too clayey	0.59			Depth to saturated zone	0.76
	Water erosion	0.99				
CoA:						
Corwin	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Carbonate content	0.68			Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
CtA:						
Crosby	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Too clayey	0.00			Depth to saturated zone	0.00
	Carbonate content	0.08			Not hard to reclaim (dense layer)	0.99
	Water erosion	0.90				
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.84
	Water erosion	0.99				
CtB:						
Crosby	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Too clayey	0.00
	Too clayey	0.00			Depth to saturated zone	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.71
	Water erosion	0.90				
	Droughty	0.99				
Celina	Poor		Fair		Fair	
	Low content of organic matter	0.00	Low strength	0.22	Too clayey	0.35
	Carbonate content	0.08	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Not hard to reclaim (dense layer)	0.99
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
CvA:						
Crosby	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Too clayey	0.08			Too clayey	0.06
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.94
	Water erosion	0.90				
Lewisburg	Poor		Fair		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.12	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08	Low strength	0.78	Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Rock fragments	0.97
CyA:						
Cyclone	Fair		Poor		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Low strength	0.00		
			Shrink-swell	0.89		
DaA:						
Dana	Fair		Poor		Fair	
	Low content of organic matter	0.88	Low strength	0.00	Depth to saturated zone	0.98
			Shrink-swell	0.92		
	Water erosion	0.90	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.99
	Carbonate content	0.92				
DaB:						
Dana	Fair		Fair		Fair	
	Low content of organic matter	0.88	Shrink-swell	0.96	Hard to reclaim (dense layer)	0.97
			Depth to saturated zone	0.98		
	Water erosion	0.90			Depth to saturated zone	0.98
	Carbonate content	0.92				
EeA:						
Eel	Fair		Fair		Poor	
	Water erosion	0.90	Depth to saturated zone	0.32	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.92			Depth to saturated zone	0.32
EgA, EgB:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08				
	Low content of organic matter	0.08			Rock fragments	0.00
					Too clayey	0.06
	Droughty	0.82				
	Water erosion	0.99				
EgB2:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08				
	Low content of organic matter	0.08			Rock fragments	0.00
					Too clayey	0.06
	Droughty	0.67				
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
EhC3:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Carbonate content	0.00
	Low content of organic matter	0.08			Hard to reclaim, rock fragments	0.00
	Droughty	0.53			Rock fragments	0.00
	Too sandy	0.78			Too sandy	0.78
	Water erosion	0.99			Slope	0.96
EhD3:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Slope	0.00
	Low content of organic matter	0.08			Rock fragments	0.00
	Droughty	0.96			Too clayey	0.00
	Water erosion	0.99				
EkA:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Too clayey	0.00
	Low content of organic matter	0.88			Rock fragments	0.00
	Water erosion	0.99				
EkB:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Too clayey	0.00
	Low content of organic matter	0.88			Rock fragments	0.50
	Water erosion	0.99				
	Droughty	0.99				
EkB2:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.00			Too clayey	0.00
	Low content of organic matter	0.88			Rock fragments	0.00
	Droughty	0.94				
	Water erosion	0.99				
FcA:						
Fincastle	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Shrink-swell	0.97	Hard to reclaim (dense layer)	0.90
	Water erosion	0.99				
FdA:						
Fincastle	Fair		Poor		Poor	
	Low content of organic matter	0.12	Low strength	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Depth to saturated zone	0.00	Hard to reclaim (dense layer)	0.94
	Water erosion	0.99	Shrink-swell	0.98		

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
FmA, FmB, FmB2:						
Fox	Fair		Fair		Fair	
	Low content of organic matter	0.12			Hard to reclaim, rock fragments	0.18
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99			Carbonate content	0.80
HeF2:						
Hennepin	Fair		Poor		Poor	
	Low content of organic matter	0.01	Slope	0.00	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08			Slope	0.00
					Carbonate content	0.08
Miamian	Fair		Poor		Poor	
	Carbonate content	0.01	Slope	0.00	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Hard to reclaim (dense layer)	0.46
	Water erosion	0.99				
HwE2:						
Hennepin	Fair		Fair		Poor	
	Low content of organic matter	0.01	Slope	0.24	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08
Wynn	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
			Low strength	0.00	Too clayey	0.29
	Too clayey	0.50	Slope	0.24	Depth to bedrock	0.54
	Depth to bedrock	0.54	Shrink-swell	0.87		
	Droughty	0.98				
	Water erosion	0.99				
HwF2:						
Hennepin	Fair		Poor		Poor	
	Low content of organic matter	0.01	Slope	0.00	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08
Wynn	Fair		Poor		Poor	
	Depth to bedrock	0.10	Depth to bedrock	0.00	Slope	0.00
	Low content of organic matter	0.12	Slope	0.00	Depth to bedrock	0.10
			Low strength	0.00	Too clayey	0.29
	Too clayey	0.50	Shrink-swell	0.87		
	Droughty	0.56				
	Water erosion	0.99				
KeC2:						
Kendallville	Fair		Fair		Fair	
	Low content of organic matter	0.08	Low strength	0.78	Rock fragments	0.28
	Carbonate content	0.16			Hard to reclaim (dense layer)	0.54
	Water erosion	0.99			Too clayey	0.59
	Too clayey	0.99			Slope	0.96

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
KeC2:						
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08			Too clayey	0.06
	Droughty	0.79			Carbonate content	0.32
	Low content of organic matter	0.88			Rock fragments	0.50
	Water erosion	0.99			Slope	0.96
KeD2:						
Kendallville	Fair		Fair		Poor	
	Low content of organic matter	0.08	Low strength	0.78	Slope	0.00
					Rock fragments	0.28
	Carbonate content	0.16			Too clayey	0.59
	Water erosion	0.99			Hard to reclaim (dense layer)	0.71
	Too clayey	0.99				
Eldean	Poor		Good		Poor	
	Carbonate content	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.08				
	Low content of organic matter	0.88			Slope	0.00
					Too clayey	0.06
	Droughty	0.94			Carbonate content	0.32
	Water erosion	0.99			Rock fragments	0.50
KnA, KoA:						
Kokomo	Fair		Poor		Poor	
	Too clayey	0.32	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68				
			Low strength	0.00	Too clayey	0.28
			Shrink-swell	0.87		
LeB:						
Lewisburg	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.00
			Depth to saturated zone	0.12		
	Carbonate content	0.08			Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Rock fragments	0.97
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.84
	Water erosion	0.99				
LfB2:						
Lewisburg	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.00
			Depth to saturated zone	0.12		
	Carbonate content	0.08			Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Rock fragments	0.97

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
LfB2:						
Celina---------------	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Hard to reclaim (dense layer)	0.54
	Too clayey	0.59			Depth to saturated zone	0.76
	Water erosion	0.99				
LgC3:						
Lewisburg-----------	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.00
	Carbonate content	0.08	Depth to saturated zone	0.12	Carbonate content	0.08
	Water erosion	0.90			Depth to saturated zone	0.12
					Slope	0.96
					Rock fragments	0.97
LpA:						
Lippincott----------	Poor		Poor		Poor	
	Carbonate content	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.00			Hard to reclaim, rock fragments	0.00
	Too clayey	0.32			Too clayey	0.32
MaA:						
Medway--------------	Fair		Fair		Fair	
	Low content of organic matter	0.32	Depth to saturated zone	0.98	Rock fragments	0.97
					Depth to saturated zone	0.98
MbB2:						
Miami---------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.54
	Carbonate content	0.16			Too clayey	0.57
	Droughty	0.95			Depth to saturated zone	0.98
	Too clayey	0.98				
	Water erosion	0.99				
McE2:						
Miami---------------	Fair		Fair		Poor	
	Low content of organic matter	0.12	Slope	0.18	Slope	0.00
	Carbonate content	0.16	Depth to saturated zone	0.98	Too clayey	0.57
	Droughty	0.97			Hard to reclaim (dense layer)	0.65
	Too clayey	0.98			Depth to saturated zone	0.98
	Water erosion	0.99				
Kendallville--------	Fair		Fair		Poor	
	Low content of organic matter	0.08	Slope	0.18	Slope	0.00
	Carbonate content	0.16	Low strength	0.78	Rock fragments	0.28
	Water erosion	0.99			Hard to reclaim (dense layer)	0.65

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
McF2:						
Miami	Fair		Poor		Poor	
	Low content of organic matter	0.12	Slope	0.00	Slope	0.00
	Carbonate content	0.16	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.03
	Water erosion	0.68			Too clayey	0.57
	Droughty	0.94			Depth to saturated zone	0.98
	Too clayey	0.98				
Kendallville	Fair		Poor		Poor	
	Carbonate content	0.16	Slope	0.00	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Rock fragments	0.72
	Water erosion	0.99	Shrink-swell	0.99		
MdC2:						
Miami	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.20
	Carbonate content	0.16			Too clayey	0.57
	Droughty	0.82			Slope	0.96
	Too clayey	0.98			Depth to saturated zone	0.98
	Water erosion	0.99				
MdD2:						
Miami	Fair		Fair		Poor	
	Low content of organic matter	0.12	Depth to saturated zone	0.98	Slope	0.00
	Carbonate content	0.16			Hard to reclaim (dense layer)	0.54
	Droughty	0.96			Too clayey	0.57
	Too clayey	0.98			Depth to saturated zone	0.98
	Water erosion	0.99				
MeC:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Carbonate content	0.01
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.10
	Water erosion	0.99			Rock fragments	0.72
					Slope	0.96
MeC2:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.03
	Too clayey	0.05			Hard to reclaim (dense layer)	0.46
	Low content of organic matter	0.18			Slope	0.96
	Water erosion	0.99				
MeD2:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Low strength	0.78	Slope	0.00
	Too clayey	0.05			Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.29
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MfB:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.23
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.90
	Too clayey	0.32				
	Water erosion	0.99				
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.84
	Water erosion	0.99				
MfB2:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.23
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.94
	Too clayey	0.32				
	Water erosion	0.99				
Celina	Fair		Fair		Fair	
	Carbonate content	0.08	Low strength	0.22	Too clayey	0.43
	Low content of organic matter	0.32	Depth to saturated zone	0.76	Depth to saturated zone	0.76
	Too clayey	0.59			Hard to reclaim (dense layer)	0.80
	Water erosion	0.99				
MgE2:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Slope	0.18	Slope	0.00
	Too clayey	0.05	Low strength	0.78	Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
Kendallville	Fair		Fair		Poor	
	Low content of organic matter	0.08	Slope	0.18	Slope	0.00
			Low strength	0.78	Rock fragments	0.28
	Carbonate content	0.16			Hard to reclaim (dense layer)	0.46
	Water erosion	0.99				
MgF2:						
Miamian	Fair		Poor		Poor	
	Carbonate content	0.01	Slope	0.00	Slope	0.00
	Too clayey	0.05	Low strength	0.78	Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.35
	Water erosion	0.99				
Kendallville	Fair		Poor		Poor	
	Low content of organic matter	0.08	Slope	0.00	Slope	0.00
			Low strength	0.78	Rock fragments	0.28
	Carbonate content	0.16			Hard to reclaim (dense layer)	0.90
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MhC3:						
Miamian	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Hard to reclaim (dense layer)	0.20
	Low content of organic matter	0.18			Slope	0.96
	Water erosion	0.99				
Losantville	Fair		Fair		Poor	
	Carbonate content	0.08	Depth to saturated zone	0.14	Hard to reclaim (dense layer)	0.00
	Low content of organic matter	0.12			Carbonate content	0.08
	Droughty	0.37			Depth to saturated zone	0.14
	Water erosion	0.99			Slope	0.96
					Rock fragments	0.97
MhD3:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Low strength	0.78	Slope	0.00
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.80
	Water erosion	0.99				
Losantville	Fair		Fair		Poor	
	Carbonate content	0.08	Depth to saturated zone	0.14	Hard to reclaim (dense layer)	0.00
	Low content of organic matter	0.12			Slope	0.00
	Droughty	0.18			Carbonate content	0.08
	Water erosion	0.99			Depth to saturated zone	0.14
					Rock fragments	0.97
MmE2:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Slope	0.18	Slope	0.00
	Too clayey	0.05	Low strength	0.78	Too clayey	0.03
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.20
	Water erosion	0.99				
Hennepin	Fair		Fair		Poor	
	Low content of organic matter	0.01	Slope	0.18	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08
MnE3:						
Miamian	Fair		Fair		Poor	
	Carbonate content	0.01	Slope	0.18	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Hard to reclaim (dense layer)	0.20
	Water erosion	0.99				
Hennepin	Fair		Fair		Poor	
	Low content of organic matter	0.01	Slope	0.18	Slope	0.00
	Carbonate content	0.08			Hard to reclaim (dense layer)	0.00
					Carbonate content	0.08

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MpA:						
Milford	Poor		Poor		Poor	
	Too clayey	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.00
	Carbonate content	0.97	Shrink-swell	0.88		
MrA:						
Milford	Fair		Poor		Poor	
	Too clayey	0.08	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Low content of organic matter	0.50	Shrink-swell	0.89	Too clayey	0.07
	Carbonate content	0.97				
MsA:						
Millsdale	Fair		Poor		Poor	
	Depth to bedrock	0.16	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Droughty	0.54	Depth to saturated zone	0.00	Depth to bedrock	0.16
			Low strength	0.00		
			Shrink-swell	0.41		
MtA:						
Millsdale	Poor		Poor		Poor	
	Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Depth to bedrock	0.54	Depth to saturated zone	0.00	Too clayey	0.00
	Droughty	0.83	Low strength	0.00	Depth to bedrock	0.54
			Shrink-swell	0.26		
MuA:						
Milton	Fair		Poor		Fair	
	Too clayey	0.02	Depth to bedrock	0.00	Too clayey	0.01
	Low content of organic matter	0.08	Low strength	0.00	Depth to bedrock	0.65
	Depth to bedrock	0.65	Shrink-swell	0.87		
	Droughty	0.89				
	Water erosion	0.99				
MuB:						
Milton	Fair		Poor		Fair	
	Too clayey	0.02	Depth to bedrock	0.00	Too clayey	0.01
	Low content of organic matter	0.08	Low strength	0.00	Depth to bedrock	0.35
	Depth to bedrock	0.35	Shrink-swell	0.87		
	Droughty	0.69				
	Water erosion	0.99				
MuB2:						
Milton	Fair		Poor		Fair	
	Too clayey	0.05	Depth to bedrock	0.00	Too clayey	0.03
	Depth to bedrock	0.35	Low strength	0.00	Depth to bedrock	0.35
	Droughty	0.52	Shrink-swell	0.87		
	Low content of organic matter	0.75				
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MuC2:						
Milton	Fair		Poor		Fair	
	Too clayey	0.05	Depth to bedrock	0.00	Too clayey	0.03
	Depth to bedrock	0.35	Low strength	0.00	Depth to bedrock	0.35
	Droughty	0.45	Shrink-swell	0.87	Slope	0.96
	Low content of organic matter	0.75				
	Water erosion	0.99				
MuD2:						
Milton	Fair		Poor		Poor	
	Too clayey	0.05	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.46	Low strength	0.00	Too clayey	0.03
	Droughty	0.63	Shrink-swell	0.87	Depth to bedrock	0.46
	Low content of organic matter	0.75				
	Water erosion	0.99				
MuE2:						
Milton	Fair		Poor		Poor	
	Too clayey	0.05	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.05	Low strength	0.00	Too clayey	0.03
	Droughty	0.09	Slope	0.24	Depth to bedrock	0.05
	Low content of organic matter	0.75	Shrink-swell	0.87		
	Water erosion	0.99				
MwA:						
Morningsun	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Hard to reclaim (dense layer)	0.80
	Low content of organic matter	0.88	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.99				
MxA:						
Morningsun	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Depth to saturated zone	0.98
	Low content of organic matter	0.88	Depth to saturated zone	0.98	Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
Xenia	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Carbonate content	0.16	Shrink-swell	0.98	Hard to reclaim (dense layer)	0.54
	Water erosion	0.99				
MxB:						
Morningsun	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Hard to reclaim (dense layer)	0.84
	Low content of organic matter	0.88	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.99				
Xenia	Fair		Fair		Fair	
	Carbonate content	0.16	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Low content of organic matter	0.68	Shrink-swell	0.95	Hard to reclaim (dense layer)	0.54
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
MxB2:						
Morningsun	Poor		Poor		Fair	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim (dense layer)	0.20
	Carbonate content	0.32	Depth to saturated zone	0.98	Depth to saturated zone	0.98
	Water erosion	0.99				
Xenia	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.35
	Carbonate content	0.16	Shrink-swell	0.98	Depth to saturated zone	0.53
	Water erosion	0.99				
MyA:						
Mahalasville	Fair		Poor		Poor	
	Carbonate content	0.92	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Water erosion	0.99	Shrink-swell	0.98		
OcA:						
Ockley	Fair		Fair		Poor	
	Low content of organic matter	0.12	Shrink-swell	0.96	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99				
OcB:						
Ockley	Fair		Fair		Poor	
	Low content of organic matter	0.12	Shrink-swell	0.95	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.68			Rock fragments	0.50
	Water erosion	0.99				
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Fair		Poor		Good	
	Low content of organic matter	0.88	Low strength	0.00		
	Carbonate content	0.97	Depth to bedrock	0.87		
RaA:						
Rainsville	Fair		Fair		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.00
	Water erosion	0.68	Shrink-swell	0.91	Depth to saturated zone	0.89
	Low content of organic matter	0.88			Rock fragments	0.94
					Too acid	0.98
RaB:						
Rainsville	Fair		Fair		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.00
	Water erosion	0.68	Shrink-swell	0.95	Depth to saturated zone	0.89
	Low content of organic matter	0.88			Rock fragments	0.94
					Too acid	0.98

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RaB2:						
Rainsville----------	Fair		Fair		Poor	
	Carbonate content	0.46	Depth to saturated zone	0.89	Hard to reclaim (dense layer)	0.00
	Low content of organic matter	0.88	Shrink-swell	0.94	Depth to saturated zone	0.89
	Water erosion	0.90			Rock fragments	0.94
					Too acid	0.98
RcA:						
Randolph-----------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Depth to bedrock	0.79	Depth to saturated zone	0.00	Too clayey	0.00
	Droughty	0.83	Low strength	0.00	Depth to bedrock	0.79
	Low content of organic matter	0.88	Shrink-swell	0.97	Rock fragments	0.88
	Water erosion	0.99				
RcB:						
Randolph-----------	Poor		Poor		Poor	
	Too clayey	0.00	Depth to bedrock	0.00	Depth to saturated zone	0.00
	Droughty	0.57	Depth to saturated zone	0.00	Too clayey	0.00
	Depth to bedrock	0.71	Low strength	0.00	Depth to bedrock	0.71
	Low content of organic matter	0.88			Rock fragments	0.88
	Water erosion	0.99				
RnE2:						
Rodman-------------	Poor		Fair		Poor	
	Too sandy	0.00	Slope	0.24	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
RnF2:						
Rodman-------------	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
RoE2:						
Rodman-------------	Poor		Fair		Poor	
	Too sandy	0.00	Slope	0.24	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50			Rock fragments	0.00
					Carbonate content	0.46
Kendallville--------	Fair		Poor		Poor	
	Carbonate content	0.16	Low strength	0.00	Slope	0.00
	Low content of organic matter	0.18	Slope	0.24	Rock fragments	0.72
	Water erosion	0.99	Shrink-swell	0.97		

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
RoF2:						
Rodman--------------	Poor		Poor		Poor	
	Too sandy	0.00	Slope	0.00	Slope	0.00
	Droughty	0.03			Too sandy	0.00
	Carbonate content	0.46			Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.50				
					Rock fragments	0.00
					Carbonate content	0.46
Kendallville--------	Fair		Poor		Poor	
	Carbonate content	0.16	Slope	0.00	Slope	0.00
	Low content of organic matter	0.18	Low strength	0.78	Rock fragments	0.28
			Shrink-swell	0.99		
	Water erosion	0.99				
RpA:						
Rossburg------------	Fair		Good		Fair	
	Water erosion	0.99			Hard to reclaim, rock fragments	0.92
RuB:						
Russell-------------	Fair		Poor		Fair	
	Carbonate content	0.80	Low strength	0.00	Hard to reclaim, rock fragments	0.98
	Low content of organic matter	0.88	Shrink-swell	0.89		
	Water erosion	0.99				
Miamian-------------	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.06
	Too clayey	0.08			Hard to reclaim (dense layer)	0.71
	Low content of organic matter	0.18				
	Water erosion	0.99				
RuB2:						
Russell-------------	Fair		Fair		Good	
	Carbonate content	0.80	Shrink-swell	0.95		
	Low content of organic matter	0.88				
	Water erosion	0.99				
Miamian-------------	Fair		Fair		Fair	
	Carbonate content	0.01	Low strength	0.78	Too clayey	0.36
	Low content of organic matter	0.18			Hard to reclaim (dense layer)	0.80
	Too clayey	0.50				
	Water erosion	0.99				
SeA:						
Savona--------------	Poor		Fair		Poor	
	Carbonate content	0.00	Depth to saturated zone	0.12	Hard to reclaim, rock fragments	0.00
	Low content of organic matter	0.00				
					Too clayey	0.05
	Too clayey	0.08			Depth to saturated zone	0.12
	Water erosion	0.99				
					Rock fragments	0.28

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SnA:						
Sloan---------------	Fair		Poor		Poor	
	Water erosion	0.99	Depth to saturated zone	0.00	Depth to saturated zone	0.00
			Shrink-swell	0.98	Hard to reclaim, rock fragments	0.92
StA:						
Stonelick-----------	Fair		Good		Poor	
	Low content of organic matter	0.01			Hard to reclaim, rock fragments	0.00
	Carbonate content	0.01			Carbonate content	0.01
	Too sandy	0.32			Too sandy	0.32
SvA:						
Sugarvalley---------	Fair		Poor		Fair	
	Carbonate content	0.32	Low strength	0.00	Depth to saturated zone	0.12
	Low content of organic matter	0.88	Depth to saturated zone	0.12		
	Water erosion	0.99	Shrink-swell	0.96		
SwA:						
Sugarvalley---------	Fair		Fair		Fair	
	Carbonate content	0.32	Depth to saturated zone	0.12	Depth to saturated zone	0.12
	Low content of organic matter	0.88	Low strength	0.22	Hard to reclaim (dense layer)	0.54
	Water erosion	0.99				
Fincastle-----------	Poor		Poor		Poor	
	Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
	Carbonate content	0.68	Shrink-swell	0.97	Hard to reclaim (dense layer)	0.71
	Water erosion	0.99				
ThA:						
Thackery------------	Poor		Poor		Poor	
	Low content of organic matter	0.00	Low strength	0.00	Hard to reclaim, rock fragments	0.00
	Carbonate content	0.68	Depth to saturated zone	0.29	Depth to saturated zone	0.29
	Water erosion	0.99	Shrink-swell	0.98	Rock fragments	0.88
ThB:						
Thackery------------	Poor		Poor		Fair	
	Low content of organic matter	0.00	Low strength	0.00	Rock fragments	0.88
	Carbonate content	0.68	Shrink-swell	0.89		
	Water erosion	0.99				
Ud:						
Udorthents----------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	
WbA:						
Warsaw--------------	Fair		Good		Poor	
	Low content of organic matter	0.50			Hard to reclaim, rock fragments	0.00
	Carbonate content	0.92				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WnA:						
Westland-----------	Fair		Poor		Poor	
	Carbonate content	0.08	Depth to saturated zone	0.00	Depth to saturated zone	0.00
					Rock fragments	0.00
					Hard to reclaim, rock fragments	0.02
WyB:						
Wynn---------------	Poor		Poor		Fair	
	Low content of organic matter	0.00	Depth to bedrock	0.00	Too clayey	0.04
	Too clayey	0.08	Low strength	0.00	Depth to bedrock	0.65
	Depth to bedrock	0.65	Shrink-swell	0.71		
	Droughty	0.92				
	Water erosion	0.99				
WyB2:						
Wynn---------------	Fair		Poor		Fair	
	Low content of organic matter	0.12	Depth to bedrock	0.00	Too clayey	0.29
	Depth to bedrock	0.35	Low strength	0.00	Depth to bedrock	0.35
	Too clayey	0.50	Shrink-swell	0.82		
	Droughty	0.89				
	Water erosion	0.99				
WyC2:						
Wynn---------------	Fair		Poor		Fair	
	Depth to bedrock	0.05	Depth to bedrock	0.00	Depth to bedrock	0.05
	Low content of organic matter	0.12	Low strength	0.00	Too clayey	0.29
	Droughty	0.46	Shrink-swell	0.87	Slope	0.96
	Too clayey	0.50				
	Water erosion	0.99				
WyD2:						
Wynn---------------	Fair		Poor		Poor	
	Low content of organic matter	0.12	Depth to bedrock	0.00	Slope	0.00
	Depth to bedrock	0.35	Low strength	0.00	Too clayey	0.29
	Too clayey	0.50	Shrink-swell	0.87	Depth to bedrock	0.35
	Droughty	0.91				
	Water erosion	0.99				
XeA:						
Xenia--------------	Fair		Fair		Fair	
	Carbonate content	0.16	Depth to saturated zone	0.53	Depth to saturated zone	0.53
	Low content of organic matter	0.68	Shrink-swell	0.96	Hard to reclaim (dense layer)	0.99
	Water erosion	0.99				
XeB:						
Xenia--------------	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.46
	Carbonate content	0.16	Shrink-swell	0.89	Depth to saturated zone	0.53
	Water erosion	0.99				

Table 17.—Construction Materials, Part II—Continued

Map symbol and soil name	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
XeB2:						
Xenia	Poor		Fair		Fair	
	Low content of organic matter	0.00	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.10
	Carbonate content	0.16	Shrink-swell	0.98	Depth to saturated zone	0.53
	Water erosion	0.99				
XfB:						
Xenia	Fair		Fair		Fair	
	Low content of organic matter	0.12	Depth to saturated zone	0.53	Hard to reclaim (dense layer)	0.20
	Carbonate content	0.16	Shrink-swell	0.97	Depth to saturated zone	0.53
	Water erosion	0.99				

Table 18.—Building Site Development, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
CeB, CeB2:						
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
CoA:						
Corwin	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
CtA, CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
DaA:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50		

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DaB:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
EeA:						
Eel	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	0.83	Depth to saturated zone	1.00	Depth to saturated zone	0.83
EgA:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
EgB:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
EgB2:						
Eldean	Not limited		Not limited		Somewhat limited	
					Slope	0.10
EhC3:						
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Slope	0.04	Slope	1.00
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
EkA:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
EkB, EkB2:						
Eldean	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10
FcA, FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
FmA:						
Fox	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
FmB, FmB2:						
Fox	Somewhat limited		Not limited		Somewhat limited	
	Shrink-swell	0.50			Shrink-swell	0.50
					Slope	0.10

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
			Depth to soft bedrock	0.46		
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to soft bedrock	0.90	Shrink-swell	0.50
			Shrink-swell	0.50		
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Slope	0.04	Slope	1.00
	Slope	0.04			Shrink-swell	0.50
Eldean	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Slope	0.04	Slope	1.00
	Slope	0.04			Shrink-swell	0.50
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
Eldean	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
KnA, KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
LeB, LfB2:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Slope	0.10

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
LeB, LfB2:						
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.04	Slope	0.04	Slope	1.00
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MaA:						
Medway	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.99		
MbB2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
					Slope	0.19
McE2, McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MdC2:						
Miami	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.99	Slope	1.00
			Slope	0.04		
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.99	Shrink-swell	0.50
MeC:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.95	Slope	1.00
			Slope	0.04		

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MeC2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Slope	1.00
	Slope	0.04	Slope	0.04	Shrink-swell	0.50
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
MfB, MfB2:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
					Slope	0.10
Celina	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.10			Depth to saturated zone	0.10
					Slope	0.10
MgE2, MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.04	Depth to saturated zone	0.95	Slope	1.00
			Slope	0.04		
Losantville	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Slope	0.04	Depth to saturated zone	1.00
MhD3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
Losantville	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	1.00	Slope	1.00	Depth to saturated zone	1.00
MmE2, MnE3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
			Depth to saturated zone	0.95		

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements		Dwellings with basements		Small commercial buildings	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MmE2, MnE3:						
Hennepin------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MpA, MrA:						
Milford-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.94			Shrink-swell	0.94
MsA:						
Millsdale-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Depth to hard bedrock	1.00	Ponding	1.00
	Depth to hard bedrock	0.84	Ponding	1.00	Depth to hard bedrock	0.84
MtA:						
Millsdale-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
	Ponding	1.00	Depth to hard bedrock	1.00	Ponding	1.00
	Depth to hard bedrock	0.46	Ponding	1.00	Depth to hard bedrock	0.46
MuA:						
Milton--------------	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
	Depth to hard bedrock	0.35	Shrink-swell	0.50	Depth to hard bedrock	0.35
MuB, MuB2:						
Milton--------------	Somewhat limited		Very limited		Somewhat limited	
	Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
MuC2:						
Milton--------------	Somewhat limited		Very limited		Very limited	
	Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Depth to hard bedrock	0.64
	Slope	0.04	Slope	0.04	Shrink-swell	0.50
MuD2:						
Milton--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
	Depth to hard bedrock	0.54	Slope	1.00	Depth to hard bedrock	0.54
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
MuE2:						
Milton--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to hard bedrock	0.95	Depth to hard bedrock	1.00	Depth to hard bedrock	0.95
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
MwA:						
Morningsun----------	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
MxA:						
Morningsun----------	Not limited		Somewhat limited		Not limited	
			Depth to saturated zone	0.99		
Xenia---------------	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
MxB, MxB2:						
Morningsun----------	Not limited		Somewhat limited		Somewhat limited	
			Depth to saturated zone	0.99	Slope	0.10
Xenia---------------	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
					Slope	0.10
MyA:						
Mahalasville--------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
OcA:						
Ockley--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
OcB:						
Ockley--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
					Slope	0.10
Pg, Pq:						
Pits----------------	Not rated		Not rated		Not rated	
PtB:						
Plattville----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
			Depth to hard bedrock	0.13		

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
RaA:						
Rainsville----------	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
			Shrink-swell	0.50		
RaB, RaB2:						
Rainsville----------	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.19
RcA:						
Randolph------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
	Depth to hard bedrock	0.20	Shrink-swell	0.50	Depth to hard bedrock	0.20
RcB:						
Randolph------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Depth to hard bedrock	1.00	Shrink-swell	0.50
	Depth to hard bedrock	0.29	Shrink-swell	0.50	Depth to hard bedrock	0.29
					Slope	0.10
RnE2, RnF2:						
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
RoE2:						
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
RoF2:						
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
RpA:						
Rossburg------------	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
			Depth to saturated zone	0.24		
RuB, RuB2:						
Russell-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
			Depth to saturated zone	0.24	Slope	0.10

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
RuB, RuB2:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
					Slope	0.10
SeA:						
Savona	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Flooding	1.00
SvA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
SwA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Shrink-swell	0.50			Shrink-swell	0.50
ThA:						
Thackery	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.87	Depth to saturated zone	1.00	Depth to saturated zone	0.87
	Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
ThB:						
Thackery	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	0.95	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Not limited		Not limited		Not limited	

Table 18.—Building Site Development, Part I—Continued

Map symbol and soil name	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.94	Shrink-swell	0.94	Shrink-swell	0.94
			Depth to soft bedrock	0.35	Slope	0.10
WyB2:						
Wynn	Somewhat limited		Somewhat limited		Somewhat limited	
	Shrink-swell	0.50	Depth to soft bedrock	0.64	Shrink-swell	0.50
			Shrink-swell	0.50	Slope	0.10
WyC2:						
Wynn	Somewhat limited		Somewhat limited		Very limited	
	Shrink-swell	0.50	Depth to soft bedrock	0.95	Slope	1.00
	Slope	0.04	Shrink-swell	0.50	Shrink-swell	0.50
			Slope	0.04		
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Depth to soft bedrock	0.64	Shrink-swell	0.50
			Shrink-swell	0.50		
XeA:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47	Shrink-swell	0.50	Depth to saturated zone	0.47
XeB:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47	Shrink-swell	0.50	Depth to saturated zone	0.47
					Slope	0.10
XeB2:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47			Depth to saturated zone	0.47
					Slope	0.10
XfB:						
Xenia	Somewhat limited		Very limited		Somewhat limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
	Depth to saturated zone	0.47	Shrink-swell	0.50	Depth to saturated zone	0.47
					Slope	0.10

Table 18.—Building Site Development, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA, CeB, CeB2:						
Celina--------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CoA:						
Corwin--------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
	Depth to saturated zone	0.19				
CtA:						
Crosby--------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Celina--------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CtB:						
Crosby--------------	Very limited		Very limited		Very limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
Celina--------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
CvA:						
Crosby--------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
CvA:						
Lewisburg----------	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Depth to saturated zone	0.78	Depth to dense layer	0.50		
	Low strength	0.28				
CyA:						
Cyclone------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
	Shrink-swell	0.50				
DaA, DaB:						
Dana---------------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Frost action	1.00				
	Shrink-swell	0.50				
EeA:						
Eel----------------	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
	Frost action	1.00	Flooding	0.60	Depth to saturated zone	0.43
	Depth to saturated zone	0.43				
EgA, EgB:						
Eldean-------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50			Gravel content	0.04
	Frost action	0.50			Droughty	0.02
					Content of large stones	0.01
EgB2:						
Eldean-------------	Somewhat limited		Very limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00	Carbonate content	1.00
					Droughty	0.13
					Gravel content	0.04
					Content of large stones	0.01
EhC3:						
Eldean-------------	Somewhat limited		Very limited		Very limited	
	Frost action	0.50	Cutbanks cave	1.00	Carbonate content	1.00
	Slope	0.04	Slope	0.04	Droughty	0.28
					Slope	0.04
					Gravel content	0.04
					Content of large stones	0.01

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50	Too clayey	0.50	Gravel content	0.04
	Frost action	0.50			Content of large stones	0.01
EkA, EkB, EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50	Too clayey	0.50		
	Frost action	0.50				
FcA, FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
FmA, FmB, FmB2:						
Fox	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to soft bedrock	0.46	Depth to bedrock	0.46
	Shrink-swell	0.50				
	Frost action	0.50				
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HwF2:						
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to soft bedrock	0.90	Depth to bedrock	0.90
	Shrink-swell	0.50				
	Frost action	0.50				
KeC2:						
Kendallville	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to dense layer	0.50	Slope	0.04
	Shrink-swell	0.50	Slope	0.04		
	Frost action	0.50				
	Slope	0.04				
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Shrink-swell	0.50	Slope	0.04	Slope	0.04
	Frost action	0.50			Droughty	0.04
	Slope	0.04				
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
Eldean	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Shrink-swell	0.50				
	Frost action	0.50				
KnA, KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00				
	Ponding	1.00				
	Shrink-swell	0.50				
LeB, LfB2:						
Lewisburg	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Low strength	0.90	Depth to dense layer	0.50		
	Depth to saturated zone	0.78				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
LgC3:						
Lewisburg	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Low strength	0.90	Depth to dense layer	0.50	Slope	0.04
	Depth to saturated zone	0.78	Slope	0.04		
	Slope	0.04				
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Carbonate content	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00				
	Shrink-swell	0.50				
MaA:						
Medway	Very limited		Somewhat limited		Somewhat limited	
	Flooding	1.00	Depth to saturated zone	0.99	Flooding	0.60
	Frost action	1.00	Flooding	0.60		
	Low strength	1.00				
MbB2:						
Miami	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
McE2, McF2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
MdC2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	0.99	Slope	0.04
	Slope	0.04	Depth to dense layer	0.50		
			Slope	0.04		
MdD2:						
Miami	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	0.99		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
MeC:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	0.95	Slope	0.04
	Low strength	0.28	Depth to dense layer	0.50		
	Slope	0.04	Slope	0.04		
MeC2:						
Miamian	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	0.95	Slope	0.04
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
MeD2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
MfB, MfB2:						
Miamian	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Celina	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.03
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.03				
MgE2, MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
MhC3:						
Miamian	Somewhat limited		Somewhat limited		Somewhat limited	
	Frost action	0.50	Depth to saturated zone	0.95	Slope	0.04
	Low strength	0.28	Depth to dense layer	0.50		
	Slope	0.04	Slope	0.04		

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
MhC3:						
Losantville----------	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.75	Depth to saturated zone	1.00	Depth to saturated zone	0.75
	Frost action	0.50	Depth to dense layer	0.50	Droughty	0.49
	Low strength	0.05	Slope	0.04	Slope	0.04
	Slope	0.04				
MhD3:						
Miamian-------------	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				
Losantville----------	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to saturated zone	1.00	Slope	1.00
	Depth to saturated zone	0.75	Slope	1.00	Droughty	0.80
	Frost action	0.50	Depth to dense layer	0.50	Depth to saturated zone	0.75
	Low strength	0.05				
MmE2, MnE3:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to saturated zone	0.95		
	Low strength	0.28	Depth to dense layer	0.50		
Hennepin------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Frost action	0.50	Depth to dense layer	0.50		
MpA:						
Milford-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Ponding	1.00	Ponding	1.00
	Frost action	1.00	Too clayey	0.50		
	Ponding	1.00				
	Shrink-swell	0.94				
MrA:						
Milford-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00	Too clayey	0.50		
	Shrink-swell	0.94				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
MsA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00	Depth to bedrock	0.84
	Shrink-swell	1.00	Too clayey	0.50		
	Ponding	1.00				
MtA:						
Millsdale	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00	Depth to bedrock	0.46
	Shrink-swell	1.00	Too clayey	0.50		
	Ponding	1.00				
MuA:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.35
	Shrink-swell	0.50				
	Frost action	0.50				
	Depth to hard bedrock	0.35				
MuB, MuB2:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
	Depth to hard bedrock	0.64				
	Shrink-swell	0.50				
	Frost action	0.50				
MuC2:						
Milton	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Depth to bedrock	0.65
	Depth to hard bedrock	0.64	Slope	0.04	Slope	0.04
	Shrink-swell	0.50				
	Frost action	0.50				
	Slope	0.04				
MuD2:						
Milton	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to hard bedrock	1.00	Slope	1.00
	Slope	1.00	Slope	1.00	Depth to bedrock	0.54
	Depth to hard bedrock	0.54				
	Shrink-swell	0.50				
	Frost action	0.50				
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
	Low strength	1.00	Slope	1.00	Depth to bedrock	0.95
	Depth to hard bedrock	0.95	Too clayey	0.50	Droughty	0.08
	Shrink-swell	0.50				
	Frost action	0.50				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
MwA:						
Morningsun----------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
			Depth to dense layer	0.50		
MxA, MxB, MxB2:						
Morningsun----------	Very limited		Very limited		Not limited	
	Low strength	1.00	Cutbanks cave	1.00		
	Frost action	1.00	Depth to saturated zone	0.99		
			Depth to dense layer	0.50		
Xenia---------------	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
MyA:						
Mahalasville--------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Frost action	1.00	Ponding	1.00		
	Ponding	1.00				
	Shrink-swell	0.50				
OcA, OcB:						
Ockley--------------	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Cutbanks cave	1.00		
	Frost action	0.50				
Pg, Pq:						
Pits----------------	Not rated		Not rated		Not rated	
PtB:						
Plattville----------	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to hard bedrock	0.13		
	Frost action	0.50				
RaA, RaB, RaB2:						
Rainsville----------	Somewhat limited		Very limited		Not limited	
	Shrink-swell	0.50	Depth to saturated zone	1.00		
	Frost action	0.50				
	Low strength	0.05				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Depth to bedrock	0.20
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Depth to hard bedrock	0.20				
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to hard bedrock	1.00	Depth to saturated zone	1.00
	Low strength	1.00	Depth to saturated zone	1.00	Depth to bedrock	0.29
	Frost action	1.00	Too clayey	0.50		
	Shrink-swell	0.50				
	Depth to hard bedrock	0.29				
RnE2, RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.99
					Gravel content	0.07
RoE2, RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Cutbanks cave	1.00	Slope	1.00
			Slope	1.00	Droughty	0.99
					Gravel content	0.07
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Low strength	1.00	Depth to dense layer	0.50		
	Shrink-swell	0.50				
	Frost action	0.50				
RpA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Cutbanks cave	1.00	Flooding	0.60
	Low strength	0.50	Flooding	0.60		
	Frost action	0.50	Depth to saturated zone	0.24		
RuB, RuB2:						
Russell	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.24		
	Frost action	1.00				
	Shrink-swell	0.50				
Miamian	Very limited		Somewhat limited		Not limited	
	Low strength	1.00	Depth to saturated zone	0.95		
	Shrink-swell	0.50	Depth to dense layer	0.50		
	Frost action	0.50				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SeA:						
Savona	Very limited		Very limited		Very limited	
	Low strength	1.00	Cutbanks cave	1.00	Carbonate content	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Depth to saturated zone	0.78				
	Shrink-swell	0.50				
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Flooding	0.80	Ponding	1.00
	Ponding	1.00				
	Shrink-swell	0.50				
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Flooding	1.00	Cutbanks cave	1.00	Flooding	1.00
	Frost action	0.50	Flooding	0.80		
SvA:						
Sugarvalley	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Frost action	1.00				
	Depth to saturated zone	0.78				
	Shrink-swell	0.50				
SwA:						
Sugarvalley	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.78
	Frost action	1.00	Depth to dense layer	0.50		
	Depth to saturated zone	0.78				
	Shrink-swell	0.50				
Fincastle	Very limited		Very limited		Very limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Frost action	1.00				
	Depth to saturated zone	1.00				
	Shrink-swell	0.50				
ThA:						
Thackery	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.48
	Low strength	1.00	Depth to saturated zone	1.00		
	Shrink-swell	0.50				
	Depth to saturated zone	0.48				
ThB:						
Thackery	Very limited		Somewhat limited		Not limited	
	Frost action	1.00	Depth to saturated zone	0.95		
	Low strength	1.00				
	Shrink-swell	0.50				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Somewhat limited		Very limited		Not limited	
	Frost action	0.50	Cutbanks cave	1.00		
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
	Frost action	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Ponding	1.00	Ponding	1.00		
			Depth to dense layer	0.50		
WyB:						
Wynn	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to soft bedrock	0.35	Depth to bedrock	0.35
	Shrink-swell	0.94				
	Frost action	0.50				
WyB2:						
Wynn	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
	Shrink-swell	0.50				
	Frost action	0.50				
WyC2:						
Wynn	Very limited		Somewhat limited		Somewhat limited	
	Low strength	1.00	Depth to soft bedrock	0.95	Depth to bedrock	0.95
	Shrink-swell	0.50			Slope	0.04
	Frost action	0.50	Slope	0.04		
	Slope	0.04				
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Low strength	1.00	Slope	1.00	Slope	1.00
	Slope	1.00	Depth to soft bedrock	0.64	Depth to bedrock	0.65
	Shrink-swell	0.50				
	Frost action	0.50				
XeA, XeB:						
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				
XeB2:						
Xenia	Very limited		Very limited		Somewhat limited	
	Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				

Table 18.—Building Site Development, Part II—Continued

Map symbol and soil name	Local roads and streets		Shallow excavations		Lawns and landscaping	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
XfB:						
Xenia	Very limited		Very limited		Somewhat limited	
	Low strength	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
	Frost action	1.00				
	Shrink-swell	0.50				
	Depth to saturated zone	0.19				

Table 19.—Sanitary Facilities, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
CeB, CeB2:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
CoA:				
Corwin	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
CtA:				
Crosby	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
CtB:				
Crosby	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.08
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.08
CvA:				
Crosby	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
CvA:				
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00		
CyA:				
Cyclone	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46	Seepage	0.53
DaA:				
Dana	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Seepage	0.53
DaB:				
Dana	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Seepage	0.53
			Slope	0.32
EeA:				
Eel	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
EgA:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		
EgB, EgB2:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46	Slope	0.32
EhC3:				
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Slope	0.04	Slope	1.00

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
EhD3:				
Eldean--------------	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
			Seepage	1.00
	Slope	1.00		
	Restricted permeability	0.72		
EkA:				
Eldean--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		
EkB, EkB2:				
Eldean--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
	Restricted permeability	0.72		
FcA:				
Fincastle-----------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
FdA:				
Fincastle-----------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
	Depth to bedrock	0.14		
FmA:				
Fox-----------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
FmB, FmB2:				
Fox-----------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
	Restricted permeability	0.46		
HeF2:				
Hennepin------------	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
HeF2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
HwE2, HwF2:				
Hennepin	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
Wynn	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00		
KeC2:				
Kendallville	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	0.04	Seepage	0.53
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72	Slope	1.00
	Slope	0.04		
KeD2:				
Kendallville	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
Eldean	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
	Restricted permeability	0.72		
KnA, KoA:				
Kokomo	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
LeB, LfB2:				
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
			Seepage	0.28

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
LeB, LfB2:				
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
LgC3:				
Lewisburg	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Seepage	0.28
LpA:				
Lippincott	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.46		
MaA:				
Medway	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Restricted permeability	0.46	Seepage	1.00
MbB2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.35
McE2, McF2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
MdC2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04	Seepage	0.53

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MdD2:				
Miami	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Seepage	0.53
MeC, MeC2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
MeD2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
MfB, MfB2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
Celina	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32
MgE2, MgF2:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Kendallville	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
MhC3:				
Miamian	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MhC3:				
Losantville---------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	0.04		
MhD3:				
Miamian-------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Losantville---------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
MmE2, MnE3:				
Miamian-------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00		
Hennepin------------	Very limited		Very limited	
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
MpA:				
Milford-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		
MrA:				
Milford-------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
			Seepage	0.53
	Ponding	1.00		
MsA, MtA:				
Millsdale-----------	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Ponding	1.00
	Ponding	1.00		

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MuA:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Seepage	0.28
MuB:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Slope	0.32
			Seepage	0.28
MuB2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Slope	0.32
			Seepage	0.28
MuC2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Restricted permeability	0.72	Slope	1.00
	Slope	0.04	Seepage	0.28
MuD2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
	Restricted permeability	0.72	Seepage	0.28
MuE2:				
Milton	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Slope	1.00	Slope	1.00
			Seepage	0.28
MwA:				
Morningsun	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
MxA:				
Morningsun	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
MxB, MxB2:				
Morningsun----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.32
Xenia---------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
MyA:				
Mahalasville--------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Seepage	1.00
	Restricted permeability	0.46	Ponding	1.00
OcA:				
Ockley--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
OcB:				
Ockley--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
			Slope	0.32
	Restricted permeability	0.46		
Pg, Pq:				
Pits----------------	Not rated		Not rated	
PtB:				
Plattville----------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	0.59	Seepage	0.53
	Restricted permeability	0.46	Slope	0.32
			Depth to hard bedrock	0.13
RaA:				
Rainsville----------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
RaB, RaB2:				
Rainsville----------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.35

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
RcA:				
Randolph------------	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00		
RcB:				
Randolph------------	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to hard bedrock	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Slope	0.32
RnE2, RnF2:				
Rodman--------------	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
RoE2, RoF2:				
Rodman--------------	Very limited		Very limited	
	Filtering capacity	1.00	Slope	1.00
	Slope	1.00	Seepage	1.00
Kendallville--------	Very limited		Very limited	
	Slope	1.00	Slope	1.00
	Restricted permeability	1.00	Seepage	0.53
RpA:				
Rossburg------------	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
	Depth to saturated zone	0.65	Depth to saturated zone	0.02
	Restricted permeability	0.46		
RuB, RuB2:				
Russell-------------	Very limited		Somewhat limited	
	Restricted permeability	1.00	Seepage	0.53
	Depth to saturated zone	0.65	Slope	0.32
			Depth to saturated zone	0.02
Miamian-------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Slope	0.32

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
SeA:				
Savona	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.72		
SnA:				
Sloan	Very limited		Very limited	
	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.72		
StA:				
Stonelick	Very limited		Very limited	
	Flooding	1.00	Flooding	1.00
	Filtering capacity	1.00	Seepage	1.00
SvA:				
Sugarvalley	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
SwA:				
Sugarvalley	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
Fincastle	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
ThA:				
Thackery	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
ThB:				
Thackery------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.46	Seepage	0.53
			Slope	0.32
Ud:				
Udorthents----------	Not rated		Not rated	
W:				
Water---------------	Not rated		Not rated	
WbA:				
Warsaw--------------	Very limited		Very limited	
	Filtering capacity	1.00	Seepage	1.00
	Restricted permeability	0.46		
WnA:				
Westland------------	Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Filtering capacity	1.00	Seepage	1.00
			Ponding	1.00
	Ponding	1.00		
	Restricted permeability	0.46		
WyB, WyB2:				
Wynn----------------	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Restricted permeability	1.00	Slope	0.32
WyC2:				
Wynn----------------	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Slope	0.04	Slope	1.00
WyD2:				
Wynn----------------	Very limited		Very limited	
	Depth to bedrock	1.00	Depth to soft bedrock	1.00
	Restricted permeability	1.00	Slope	1.00
	Slope	1.00		
XeA:				
Xenia---------------	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53

Table 19.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Septic tank absorption fields		Sewage lagoons	
	Rating class and limiting features	Value	Rating class and limiting features	Value
XeB, XeB2:				
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
			Slope	0.32
XfB:				
Xenia	Very limited		Very limited	
	Restricted permeability	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Seepage	0.53
	Depth to bedrock	0.22	Slope	0.32

Table 19.—Sanitary Facilities, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA, CeB:						
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
					Too clayey	0.50
CeB2:						
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
CoA:						
Corwin	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
					Too clayey	0.50
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too clayey	0.50			Too clayey	0.50

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DaA, DaB:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
EeA:						
Eel	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Seepage	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
	Seepage	1.00				
EgA:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too sandy	0.50			Gravel content	0.97
					Too sandy	0.50
EgB:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too sandy	0.50			Gravel content	0.98
					Too sandy	0.50
EgB2:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too sandy	0.50			Gravel content	1.00
					Too sandy	0.50
EhC3:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Gravel content	1.00
	Too sandy	0.50	Slope	0.04	Carbonate content	1.00
	Slope	0.04			Too sandy	0.50
					Slope	0.04
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
					Gravel content	0.92
EkA:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
					Gravel content	0.81
EkB:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
					Gravel content	0.73
EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
					Gravel content	0.92

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FcA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50
FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Depth to bedrock	1.00			Too clayey	0.50
	Too clayey	0.50				
FmA:						
Fox	Somewhat limited		Very limited		Very limited	
	Too clayey	0.50	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Too clayey	0.50
					Too sandy	0.50
FmB:						
Fox	Somewhat limited		Very limited		Very limited	
	Too sandy	0.50	Seepage	1.00	Seepage	1.00
					Too sandy	0.50
					Too clayey	0.50
FmB2:						
Fox	Somewhat limited		Very limited		Very limited	
	Too sandy	0.50	Seepage	1.00	Seepage	1.00
					Too sandy	0.50
					Too clayey	0.50
					Gravel content	0.01
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
HwE2, HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Somewhat limited	
	Slope	0.04	Slope	0.04	Slope	0.04
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Too sandy	0.50	Slope	0.04	Gravel content	0.90
	Slope	0.04			Too sandy	0.50
					Slope	0.04

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeD2:						
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
Eldean	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Too sandy	0.50			Gravel content	0.71
					Too sandy	0.50
KnA, KoA:						
Kokomo	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Hard to compact	1.00
	Too clayey	0.50			Ponding	1.00
					Too clayey	0.50
LeB, LfB2:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Celina	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.04	Slope	0.04	Slope	0.04
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Seepage	1.00	Carbonate content	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too sandy	0.50			Gravel content	0.79
					Too sandy	0.50
MaA:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.24
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
	Seepage	1.00	Seepage	1.00		
MbB2:						
Miami	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
McE2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
McF2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Too clayey	0.50
MdC2:						
Miami---------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Slope	0.04	Depth to saturated zone	0.24
	Slope	0.04	Depth to saturated zone	0.04	Slope	0.04
MdD2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.04	Depth to saturated zone	0.24
MeC, MeC2:						
Miamian-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Slope	0.04	Depth to saturated zone	0.09
	Slope	0.04			Slope	0.04
MeD2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
MfB, MfB2:						
Miamian-------------	Somewhat limited		Not limited		Somewhat limited	
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Celina--------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.95	Depth to saturated zone	0.44	Depth to saturated zone	0.68
MgE2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgF2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Too clayey	0.50
MhC3:						
Miamian-------------	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.44	Slope	0.04	Depth to saturated zone	0.09
	Slope	0.04			Slope	0.04
Losantville---------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Slope	0.04	Slope	0.04	Slope	0.04
MhD3:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Losantville---------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	1.00
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
MmE2, MnE3:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
Hennepin------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
MpA:						
Milford-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Too clayey	1.00
					Ponding	1.00
MrA:						
Milford-------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
MsA, MtA:						
Millsdale----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	1.00	Ponding	1.00	Too clayey	1.00
	Ponding	1.00			Hard to compact	1.00
					Ponding	1.00
MuA, MuB, MuB2:						
Milton-------------	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Too clayey	0.50
MuC2:						
Milton-------------	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50	Slope	0.04	Too clayey	0.50
	Slope	0.04			Slope	0.04
MuD2:						
Milton-------------	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	0.50			Too clayey	0.50
MuE2:						
Milton-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
	Too clayey	1.00			Too clayey	1.00
MwA:						
Morningsun---------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.24
MxA, MxB:						
Morningsun---------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.24
Xenia--------------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
MxB2:						
Morningsun---------	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	0.50
	Too sandy	0.50			Depth to saturated zone	0.24
Xenia--------------	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50				
OcA:						
Ockley	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.13
OcB:						
Ockley	Very limited		Not limited		Somewhat limited	
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.09
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Depth to bedrock	1.00	Depth to bedrock	0.14	Depth to bedrock	0.14
	Too clayey	0.50			Depth to saturated zone	0.09
RaA, RaB, RaB2:						
Rainsville	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.86	Depth to saturated zone	0.19	Too clayey	0.50
	Too clayey	0.50			Depth to saturated zone	0.47
RcA, RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to bedrock	1.00
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to saturated zone	1.00
	Too clayey	1.00			Too clayey	1.00
					Hard to compact	1.00
RnE2, RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Gravel content	1.00
					Too sandy	0.50
RoE2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Gravel content	1.00
					Too sandy	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Too clayey	0.50			Too clayey	0.50

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Seepage	1.00	Seepage	1.00	Seepage	1.00
	Too sandy	0.50			Gravel content	1.00
					Too sandy	0.50
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Too clayey	0.50
RpA:						
Rossburg	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Too sandy	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
	Seepage	1.00	Seepage	1.00		
	Too sandy	1.00				
RuB, RuB2:						
Russell	Somewhat limited		Not limited		Somewhat limited	
	Too clayey	0.50			Too clayey	0.50
Miamian	Somewhat limited		Not limited		Somewhat limited	
	Depth to saturated zone	0.44			Depth to saturated zone	0.09
SeA:						
Savona	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00			Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
					Carbonate content	1.00
					Too clayey	0.50
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Seepage	1.00	Ponding	1.00	Too clayey	0.50
	Ponding	1.00				
	Too clayey	0.50				
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Flooding	1.00	Flooding	1.00	Seepage	1.00
	Seepage	1.00	Seepage	1.00	Gravel content	0.63
	Too sandy	0.50			Too sandy	0.50
SvA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too clayey	0.50			Too clayey	0.50

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
SwA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Too clayey	0.50
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Too clayey	0.50
ThA:						
Thackery	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.96
	Seepage	1.00			Too clayey	0.50
	Too clayey	0.50				
ThB:						
Thackery	Very limited		Very limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
	Seepage	1.00			Depth to saturated zone	0.09
	Too clayey	0.50				
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	Too sandy	1.00
	Too sandy	1.00			Seepage	1.00
					Gravel content	0.68
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Seepage	1.00	Ponding	1.00	Ponding	1.00
	Ponding	1.00			Too clayey	0.50
	Too clayey	0.50			Gravel content	0.01
WyB, WyB2:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50			Hard to compact	1.00
					Too clayey	0.50
WyC2:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Too clayey	0.50	Slope	0.04	Hard to compact	1.00
	Slope	0.04			Too clayey	0.50
					Slope	0.04

Table 19.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
	Slope	1.00	Slope	1.00	Hard to compact	1.00
	Too clayey	0.50			Slope	1.00
					Too clayey	0.50
XeA, XeB:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
	Too clayey	0.50			Too clayey	0.50
XeB2:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
					Too clayey	0.50
XfB:						
Xenia	Very limited		Somewhat limited		Somewhat limited	
	Depth to bedrock	1.00	Depth to saturated zone	0.75	Depth to saturated zone	0.86
	Depth to saturated zone	1.00			Too clayey	0.50
	Too clayey	0.50				

Table 20.—Agricultural Waste Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.06	Shallow to densic materials	0.06		
CeB:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.01	Shallow to densic materials	0.01	Too steep for surface application	0.08
CeB2:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.64	Shallow to densic materials	0.64	Too steep for surface application	0.08
CoA:						
Corwin	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
	Shallow to densic materials	0.01	Shallow to densic materials	0.01		
CtA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07
	Shallow to densic materials	0.01	Shallow to densic materials	0.01		

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CtA:						
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.15	Shallow to densic materials	0.15		
CtB:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.29	Shallow to densic materials	0.29	Droughty	0.13
	Droughty	0.13	Droughty	0.13	Too acid	0.07
	Too acid	0.02	Too acid	0.07		
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.01	Shallow to densic materials	0.01		
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.06	Too acid	0.07	Too acid	0.07
	Too acid	0.02	Shallow to densic materials	0.06	Droughty	0.01
	Droughty	0.01	Droughty	0.01		
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00		
	Restricted permeability	1.00				
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
DaA:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60
DaB:						
Dana	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.74	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Restricted permeability	0.60	Restricted permeability	0.60
					Too steep for surface application	0.08
EeA:						
Eel	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Leaching limitation	0.45				
EgA:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.50	Droughty	0.50	Droughty	0.50
	Shallow to discontinuity	0.46	Shallow to discontinuity	0.46		
EgB:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.50	Droughty	0.50	Droughty	0.50
	Shallow to discontinuity	0.46	Shallow to discontinuity	0.46	Too steep for surface application	0.08
EgB2:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to discontinuity	0.79	Shallow to discontinuity	0.79	Droughty	0.69
	Droughty	0.69	Droughty	0.69	Too steep for surface application	0.08

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
EhC3:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Dense layer	1.00	Shallow to discontinuity	0.97	Too steep for surface application	1.00
	Shallow to discontinuity	0.97	Droughty	0.81	Droughty	0.81
	Droughty	0.81	Slope	0.04	Too steep for sprinkler application	0.22
	Slope	0.04				
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Droughty	0.23	Droughty	0.23	Too steep for sprinkler application	1.00
	Shallow to discontinuity	0.10	Shallow to discontinuity	0.10	Droughty	0.23
EkA:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to discontinuity	0.06	Shallow to discontinuity	0.06	Droughty	0.04
	Droughty	0.04	Droughty	0.04		
EkB:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to discontinuity	0.15	Shallow to discontinuity	0.15	Droughty	0.13
	Droughty	0.13	Droughty	0.13	Too steep for surface application	0.08
EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to discontinuity	0.29	Shallow to discontinuity	0.29	Droughty	0.28
	Droughty	0.28	Droughty	0.28	Too steep for surface application	0.08
FcA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Low adsorption	1.00	Restricted permeability	1.00
	Too acid	0.02	Restricted permeability	1.00	Too acid	0.07
			Too acid	0.07		
FmA:						
Fox	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to discontinuity	0.03	Too acid	0.07	Too acid	0.07
	Too acid	0.02	Shallow to discontinuity	0.03		
FmB:						
Fox	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to discontinuity	0.03	Too acid	0.07	Too steep for surface application	0.08
	Too acid	0.02	Shallow to discontinuity	0.03	Too acid	0.07
FmB2:						
Fox	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
	Shallow to discontinuity	0.01	Shallow to discontinuity	0.01	Too acid	0.07
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
HeF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.54	Shallow to densic materials	0.54	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.46	Slope	1.00	Too steep for sprinkler application	1.00
	Restricted permeability	0.41	Depth to bedrock	0.46	Depth to bedrock	0.46
	Too acid	0.02	Restricted permeability	0.31	Restricted permeability	0.31
	Droughty	0.02	Too acid	0.07	Too acid	0.07
HwF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.90	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.44	Depth to bedrock	0.90	Depth to bedrock	0.90
	Restricted permeability	0.41	Droughty	0.44	Droughty	0.44
	Too acid	0.02	Restricted permeability	0.31	Restricted permeability	0.31

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeC2:						
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Shallow to densic materials	0.46	Shallow to densic materials	0.46	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
Eldean--------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to discontinuity	0.79	Shallow to discontinuity	0.79	Too steep for surface application	1.00
	Droughty	0.56	Droughty	0.56	Droughty	0.56
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
KeD2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.29	Shallow to densic materials	0.29	Restricted permeability	0.31
Eldean--------------	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Droughty	0.28	Droughty	0.28	Too steep for sprinkler application	1.00
	Shallow to discontinuity	0.20	Shallow to discontinuity	0.20	Droughty	0.28
KnA, KoA:						
Kokomo--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LeB:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
	Restricted permeability	1.00				
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.15	Shallow to densic materials	0.15	Too steep for surface application	0.08
LfB2:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	0.08
	Restricted permeability	1.00				
Celina	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.46	Shallow to densic materials	0.46	Too steep for surface application	0.08
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Slope	0.04	Too steep for sprinkler application	0.22
	Slope	0.04				

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Shallow to discontinuity	0.06	Shallow to discontinuity	0.06	Droughty	0.01
	Droughty	0.01	Droughty	0.01		
MaA:						
Medway	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Flooding	0.60
MbB2:						
Miami	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Dense layer	1.00	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Shallow to densic materials	0.46	Droughty	0.17
	Shallow to densic materials	0.46	Droughty	0.17	Too steep for surface application	0.10
	Droughty	0.17				
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeablity	1.00	Too steep for sprinkler application	1.00
	Dense layer	1.00	Depth to saturated zone	0.68	Restricted permeability	1.00
	Depth to saturated zone	0.68	Shallow to densic materials	0.35	Depth to saturated zone	0.68
	Shallow to densic materials	0.35	Droughty	0.13	Droughty	0.13
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Shallow to densic materials	0.35	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.35	Restricted permeability	0.31	Restricted permeability	0.31

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
McF2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Dense layer	1.00	Depth to saturated zone	0.68	Restricted permeability	1.00
	Depth to saturated zone	0.68	Shallow to densic materials	0.64	Depth to saturated zone	0.68
	Shallow to densic materials	0.64	Droughty	0.19	Droughty	0.19
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
					Restricted permeability	0.31
MdC2:						
Miami---------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Dense layer	1.00	Shallow to densic materials	0.79	Too steep for surface application	1.00
	Shallow to densic materials	0.79	Depth to saturated zone	0.68	Depth to saturated zone	0.68
	Depth to saturated zone	0.68	Droughty	0.39	Droughty	0.39
	Droughty	0.39	Slope	0.04	Too steep for sprinkler application	0.22
MdD2:						
Miami---------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.46	Shallow to densic materials	0.46	Depth to saturated zone	0.68
	Droughty	0.16	Droughty	0.16	Droughty	0.16

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MeC:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.90	Shallow to densic materials	0.90	Too steep for surface application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
MeC2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.54	Shallow to densic materials	0.54	Too steep for surface application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
MeD2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.71	Shallow to densic materials	0.71	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
MfB:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.10	Shallow to densic materials	0.10	Too steep for surface application	0.08
Celina--------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.15	Shallow to densic materials	0.15	Too steep for surface application	0.08

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MfB2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.06	Shallow to densic materials	0.06	Too steep for surface application	0.08
Celina--------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.95	Depth to saturated zone	0.95	Depth to saturated zone	0.95
	Shallow to densic materials	0.20	Shallow to densic materials	0.20	Too steep for surface application	0.08
MgE2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Restricted permeability	1.00
	Shallow to densic materials	0.01	Shallow to densic materials	0.01	Depth to saturated zone	0.43
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Shallow to densic materials	0.54	Shallow to densic materials	0.54	Too steep for sprinkler application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
MgF2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.64	Shallow to densic materials	0.64	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MgF2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.10	Shallow to densic materials	0.10	Restricted permeability	0.31
MhC3:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Shallow to densic materials	0.79	Shallow to densic materials	0.79	Too steep for surface application	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
Losantville---------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Restricted permeability	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Droughty	0.90	Droughty	0.90
	Droughty	0.90	Slope	0.04	Too steep for sprinkler application	0.22
MhD3:						
Miamian-------------	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
	Slope	1.00	Slope	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.20	Shallow to densic materials	0.20	Depth to saturated zone	0.43

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
MhD3:						
Losantville---------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for surface application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00	Slope	1.00	Too steep for sprinkler application	1.00
	Slope	1.00	Droughty	0.98	Droughty	0.98
MmE2, MnE3:						
Miamian------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	0.79	Shallow to densic materials	0.79	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
Hennepin-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Dense layer	1.00	Shallow to densic materials	1.00	Too steep for sprinkler application	1.00
	Shallow to densic materials	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Restricted permeability	1.00				
MpA, MrA:						
Milford------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
MsA:						
Millsdale----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Low adsorption	1.00	Ponding	1.00
	Depth to bedrock	0.84	Ponding	1.00	Depth to bedrock	0.84
	Leaching limitation	0.70	Depth to bedrock	0.84	Droughty	0.46
	Droughty	0.46	Droughty	0.46	Restricted permeability	0.31

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MtA:						
Millsdale-----------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Low adsorption	1.00	Ponding	1.00
	Leaching limitation	0.70	Ponding	1.00	Depth to bedrock	0.46
	Depth to bedrock	0.46	Depth to bedrock	0.46	Restricted permeability	0.31
	Restricted permeability	0.41	Restricted permeability	0.31	Droughty	0.17
MuA:						
Milton-------------	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.35	Low adsorption	1.00	Depth to bedrock	0.35
	Droughty	0.11	Depth to bedrock	0.35	Droughty	0.11
	Too acid	0.02	Droughty	0.11	Too acid	0.07
			Too acid	0.07		
MuB:						
Milton-------------	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.65	Low adsorption	1.00	Depth to bedrock	0.65
	Droughty	0.31	Depth to bedrock	0.65	Droughty	0.31
	Too acid	0.02	Droughty	0.31	Too steep for surface application	0.08
			Too acid	0.07	Too acid	0.07
MuB2:						
Milton-------------	Somewhat limited		Very limited		Somewhat limited	
	Depth to bedrock	0.65	Low adsorption	1.00	Depth to bedrock	0.65
	Droughty	0.48	Depth to bedrock	0.65	Droughty	0.48
	Too acid	0.02	Droughty	0.48	Too steep for surface application	0.08
			Too acid	0.07	Too acid	0.07
MuC2:						
Milton-------------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.65	Low adsorption	1.00	Too steep for surface application	1.00
	Droughty	0.55	Depth to bedrock	0.65	Depth to bedrock	0.65
	Slope	0.04	Droughty	0.55	Droughty	0.55
	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.22
			Slope	0.04	Too acid	0.07
MuD2:						
Milton-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.54	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.37	Depth to bedrock	0.54	Depth to bedrock	0.54
	Too acid	0.02	Droughty	0.37	Droughty	0.37
			Too acid	0.07	Too acid	0.07

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
MuE2:						
Milton	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.95	Slope	1.00	Too steep for sprinkler application	1.00
	Droughty	0.91	Depth to bedrock	0.95	Depth to bedrock	0.95
	Too acid	0.02	Droughty	0.91	Droughty	0.91
			Too acid	0.07	Too acid	0.07
MwA:						
Morningsun	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
MxA:						
Morningsun	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
MxB, MxB2:						
Morningsun	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.68	Depth to saturated zone	0.68	Depth to saturated zone	0.68
					Too steep for surface application	0.08
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Too steep for surface application	0.08
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
OcA:						
Ockley	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Droughty	0.01	Droughty	0.01	Droughty	0.01

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
OcB:						
Ockley	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
					Too steep for surface application	0.08
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Somewhat limited		Very limited		Somewhat limited	
	Depth to saturated zone	0.43	Low adsorption	1.00	Depth to saturated zone	0.43
			Depth to saturated zone	0.43	Too steep for surface application	0.08
RaA:						
Rainsville	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too acid	0.07
RaB, RaB2:						
Rainsville	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	0.86	Depth to saturated zone	0.86
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.10
					Too acid	0.07
RcA:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.41	Low adsorption	1.00	Too acid	0.31
	Depth to bedrock	0.20	Too acid	0.31	Restricted permeability	0.31
	Droughty	0.17	Restricted permeability	0.31	Depth to bedrock	0.20
	Too acid	0.08	Depth to bedrock	0.20	Droughty	0.17
RcB:						
Randolph	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Droughty	0.43	Low adsorption	1.00	Droughty	0.43
	Restricted permeability	0.41	Droughty	0.43	Too acid	0.31
	Depth to bedrock	0.29	Too acid	0.31	Restricted permeability	0.31
	Too acid	0.08	Restricted permeability	0.31	Depth to bedrock	0.29

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
RnE2, RnF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Filtering capacity	1.00	Slope	1.00	Too steep for surface application	1.00
	Droughty	1.00	Droughty	1.00	Too steep for sprinkler application	1.00
	Leaching limitation	0.45			Droughty	1.00
RoE2, RoF2:						
Rodman	Very limited		Very limited		Very limited	
	Slope	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Filtering capacity	1.00	Slope	1.00	Too steep for surface application	1.00
	Droughty	1.00	Droughty	1.00	Too steep for sprinkler application	1.00
	Leaching limitation	0.45			Droughty	1.00
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
	Restricted permeability	0.41	Restricted permeability	0.31	Too steep for sprinkler application	1.00
					Restricted permeability	0.31
RpA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Flooding	1.00	Flooding	1.00	Flooding	0.60
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
RuB:						
Russell	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.41	Restricted permeability	0.30	Restricted permeability	0.30
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.29	Shallow to densic materials	0.29	Too steep for surface application	0.08

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
RuB2:						
Russell	Somewhat limited		Somewhat limited		Somewhat limited	
	Restricted permeability	0.41	Restricted permeability	0.30	Restricted permeability	0.30
	Too acid	0.02	Too acid	0.07	Too steep for surface application	0.08
					Too acid	0.07
Miamian	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
	Shallow to densic materials	0.20	Shallow to densic materials	0.20	Too steep for surface application	0.08
SeA:						
Savona	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
SnA:						
Sloan	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
	Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01
StA:						
Stonelick	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Flooding	1.00	Flooding	1.00	Flooding	1.00
SvA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.08	Too acid	0.31	Too acid	0.31
SwA:						
Sugarvalley	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Too acid	0.08	Too acid	0.31	Too acid	0.31
Fincastle	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Too acid	0.02	Too acid	0.07	Too acid	0.07

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ThA:						
Thackery	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
ThB:						
Thackery	Somewhat limited		Somewhat limited		Somewhat limited	
	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
					Too steep for surface application	0.08
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Shallow to discontinuity	0.46	Shallow to discontinuity	0.46		
WnA:						
Westland	Very limited		Very limited		Very limited	
	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
	Ponding	1.00	Ponding	1.00	Ponding	1.00
WyB:						
Wynn	Somewhat limited		Very limited		Somewhat limited	
	Restricted permeability	0.74	Low adsorption	1.00	Restricted permeability	0.60
	Depth to bedrock	0.35	Restricted permeability	0.60	Depth to bedrock	0.35
	Droughty	0.08	Depth to bedrock	0.35	Too steep for surface application	0.08
	Too acid	0.02	Droughty	0.08	Droughty	0.08
			Too acid	0.07	Too acid	0.07
WyB2:						
Wynn	Somewhat limited		Very limited		Somewhat limited	
	Restricted permeability	0.74	Low adsorption	1.00	Depth to bedrock	0.65
	Depth to bedrock	0.65	Depth to bedrock	0.65	Restricted permeability	0.60
	Droughty	0.11	Restricted permeability	0.60	Droughty	0.11
	Too acid	0.02	Droughty	0.11	Too steep for surface application	0.08
			Too acid	0.07	Too acid	0.07

Table 20.—Agricultural Waste Management—Continued

Map symbol and soil name	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
WyC2:						
Wynn	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.95	Low adsorption	1.00	Too steep for surface application	1.00
	Droughty	0.54	Depth to bedrock	0.95	Depth to bedrock	0.95
	Restricted permeability	0.41	Droughty	0.54	Droughty	0.54
	Slope	0.04	Restricted permeability	0.31	Restricted permeability	0.31
	Too acid	0.02	Too acid	0.07	Too steep for sprinkler application	0.22
WyD2:						
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Low adsorption	1.00	Too steep for surface application	1.00
	Depth to bedrock	0.65	Slope	1.00	Too steep for sprinkler application	1.00
	Restricted permeability	0.41	Depth to bedrock	0.65	Depth to bedrock	0.65
	Droughty	0.09	Restricted permeability	0.31	Restricted permeability	0.31
	Too acid	0.02	Droughty	0.09	Droughty	0.09
XeA:						
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
XeB, XeB2:						
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
					Too steep for surface application	0.08
XfB:						
Xenia	Very limited		Very limited		Very limited	
	Restricted permeability	1.00	Low adsorption	1.00	Restricted permeability	1.00
	Depth to saturated zone	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
			Depth to saturated zone	1.00	Too steep for surface application	0.08

Table 21.—Water Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Not limited		Somewhat limited		Very limited	
			Thin layer	0.53	No ground water	1.00
			Depth to saturated zone	0.25		
CeB:						
Celina	Not limited		Somewhat limited		Very limited	
			Thin layer	0.61	No ground water	1.00
			Depth to saturated zone	0.25		
CeB2:						
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.26		
			Depth to saturated zone	0.25		
CoA:						
Corwin	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.61	No ground water	1.00
			Depth to saturated zone	0.47		
CtA:						
Crosby	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.63		
			Piping	0.50		
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.46		
			Depth to saturated zone	0.25		
CtB:						
Crosby	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Piping	0.50		
			Thin layer	0.39		
Celina	Not limited		Somewhat limited		Very limited	
			Thin layer	0.63	No ground water	1.00
			Depth to saturated zone	0.25		

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
CvA:						
Crosby	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.53		
			Piping	0.50		
Lewisburg	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
CyA:						
Cyclone	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Ponding	1.00	Slow refill	0.28
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Thin layer	0.72		
			Piping	0.50		
DaA:						
Dana	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.03		
DaB:						
Dana	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.93	No ground water	1.00
			Depth to saturated zone	0.03		
EeA:						
Eel	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.10
			Seepage	1.00		
			Thin layer	0.93		
EgA, EgB:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
EgB2:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.20	No ground water	1.00
EhC3:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.07	No ground water	1.00
EhD3:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.50	No ground water	1.00
	Slope	0.03				
EkA:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.53	No ground water	1.00

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
EkB:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.46	No ground water	1.00
EkB2:						
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.39	No ground water	1.00
FcA:						
Fincastle	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.87		
FdA:						
Fincastle	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	1.00		
FmA, FmB:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Thin layer	1.00	No ground water	1.00
			Seepage	1.00		
FmB2:						
Fox	Very limited		Very limited		Very limited	
	Seepage	1.00	Seepage	1.00	No ground water	1.00
			Thin layer	0.87		
HeF2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.82			No ground water	1.00
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.82	Thin layer	0.30	No ground water	1.00
HwE2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.17			No ground water	1.00
Wynn	Somewhat limited		Very limited		Very limited	
	Slope	0.17	Thin layer	1.00	No ground water	1.00
	Depth to bedrock	0.11	Hard to compact	1.00		
HwF2:						
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.82			No ground water	1.00
Wynn	Somewhat limited		Very limited		Very limited	
	Slope	0.82	Thin layer	1.00	No ground water	1.00
	Depth to bedrock	0.30	Hard to compact	1.00		
KeC2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
			Thin layer	0.33		
Eldean	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.20	No ground water	1.00

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KeD2:						
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.03	Thin layer	0.39		
Eldean--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.43	No ground water	1.00
	Slope	0.03				
KnA:						
Kokomo--------------	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
			Thin layer	0.66		
KoA:						
Kokomo--------------	Not limited		Very limited		Somewhat limited	
			Thin layer	1.00	Slow refill	0.96
			Ponding	1.00	Cutbanks cave	0.10
			Depth to saturated zone	1.00		
			Hard to compact	1.00		
LeB:						
Lewisburg-----------	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
Celina--------------	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.46		
			Depth to saturated zone	0.25		
LfB2:						
Lewisburg-----------	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		
Celina--------------	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.33		
			Depth to saturated zone	0.25		
LgC3:						
Lewisburg-----------	Not limited		Somewhat limited		Very limited	
			Depth to saturated zone	0.87	No ground water	1.00
			Piping	0.50		

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
LpA:						
Lippincott----------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.53		
MaA:						
Medway--------------	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Thin layer	0.61	Depth to water	0.14
			Piping	0.50	Cutbanks cave	0.10
			Depth to saturated zone	0.37		
MbB2:						
Miami---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
			Thin layer	0.33		
			Depth to saturated zone	0.03		
McE2:						
Miami---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.18	Thin layer	0.37		
			Depth to saturated zone	0.03		
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.18	Thin layer	0.37		
McF2:						
Miami---------------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Piping	0.50	No ground water	1.00
	Seepage	0.50	Thin layer	0.26		
			Depth to saturated zone	0.03		
Kendallville--------	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.67	No ground water	1.00
	Seepage	0.50	Piping	0.50		
MdC2:						
Miami---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
			Thin layer	0.20		
			Depth to saturated zone	0.03		
MdD2:						
Miami---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.03	Thin layer	0.33		
			Depth to saturated zone	0.03		
MeC:						
Miamian-------------	Not limited		Somewhat limited		Very limited	
			Thin layer	0.13	No ground water	1.00

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
MeC2:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.30	No ground water	1.00
MeD2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.03	Thin layer	0.24	No ground water	1.00
MfB:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.50	No ground water	1.00
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.46		
			Depth to saturated zone	0.25		
MfB2:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.53	No ground water	1.00
Celina	Not limited		Somewhat limited		Very limited	
			Piping	0.50	No ground water	1.00
			Thin layer	0.43		
			Depth to saturated zone	0.25		
MgE2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.18	Thin layer	0.61	No ground water	1.00
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Piping	0.50	No ground water	1.00
	Slope	0.18	Thin layer	0.30		
MgF2:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.26	No ground water	1.00
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.50	No ground water	1.00
	Seepage	0.50				
MhC3:						
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.20	No ground water	1.00
Losantville	Not limited		Very limited		Somewhat limited	
			Depth to saturated zone	1.00	Slow refill	0.96
					Cutbanks cave	0.10
			Piping	0.50		
MhD3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.03	Thin layer	0.43	No ground water	1.00
Losantville	Somewhat limited		Very limited		Very limited	
	Slope	0.03	Depth to saturated zone	1.00	Slow refill	1.00
					Cutbanks cave	0.10
			Piping	0.50		

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
MmE2, MnE3:						
Miamian	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.18	Thin layer	0.20	No ground water	1.00
Hennepin	Somewhat limited		Not limited		Very limited	
	Slope	0.18			No ground water	1.00
MpA:						
Milford	Not limited		Very limited		Somewhat limited	
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Thin layer	0.87		
MrA:						
Milford	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Ponding	1.00		
			Depth to saturated zone	1.00		
MsA:						
Millsdale	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.96	Thin layer	1.00	Depth to bedrock	1.00
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
MtA:						
Millsdale	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.86	Thin layer	1.00	Depth to bedrock	1.00
			Ponding	1.00	Slow refill	0.96
			Depth to saturated zone	1.00	Cutbanks cave	0.10
			Hard to compact	1.00		
MuA:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.83	Thin layer	1.00	No ground water	1.00
	Seepage	0.25	Piping	0.50		
MuB:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.91	Thin layer	1.00	No ground water	1.00
	Seepage	0.25	Piping	0.50		
MuB2, MuC2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.91	Thin layer	1.00	No ground water	1.00
	Seepage	0.25				
MuD2:						
Milton	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.88	Thin layer	1.00	No ground water	1.00
	Seepage	0.25				
	Slope	0.03				

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
MuE2:						
Milton--------------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.99	Thin layer	1.00	No ground water	1.00
	Seepage	0.25	Piping	0.50		
	Slope	0.17				
MwA:						
Morningsun----------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14
MxA:						
Morningsun----------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	0.37	Slow refill	0.28
					Depth to water	0.14
Xenia---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.83	No ground water	1.00
			Depth to saturated zone	0.47		
MxB:						
Morningsun----------	Somewhat limited		Somewhat limited		Somewhat limited	
	Seepage	0.50	Thin layer	0.93	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14
Xenia---------------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Depth to saturated zone	0.47		
MxB2:						
Morningsun----------	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Piping	0.50	Slow refill	0.28
			Depth to saturated zone	0.37	Depth to water	0.14
Xenia---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.83	No ground water	1.00
			Depth to saturated zone	0.47		
MyA:						
Mahalasville--------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.80		
OcA:						
Ockley--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.70	No ground water	1.00

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
OcB:						
Ockley	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.63	No ground water	1.00
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Slow refill	0.28
	Depth to bedrock	0.03	Piping	0.50	Depth to water	0.25
			Depth to saturated zone	0.11	Depth to bedrock	0.13
					Cutbanks cave	0.10
RaA, RaB, RaB2:						
Rainsville	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.12		
RcA:						
Randolph	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.77	Thin layer	1.00	Depth to bedrock	1.00
			Depth to saturated zone	1.00	Slow refill	0.96
					Cutbanks cave	0.10
			Hard to compact	1.00		
RcB:						
Randolph	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.81	Thin layer	1.00	Depth to bedrock	1.00
			Depth to saturated zone	1.00	Slow refill	0.96
					Cutbanks cave	0.10
			Hard to compact	1.00		
RnE2:						
Rodman	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.17				
RnF2:						
Rodman	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.80				
RoE2:						
Rodman	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.17				
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.76	No ground water	1.00
	Slope	0.17	Piping	0.50		
RoF2:						
Rodman	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Seepage	0.18	No ground water	1.00
	Slope	0.80				

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RoF2:						
Kendallville	Somewhat limited		Somewhat limited		Very limited	
	Slope	0.80	Thin layer	0.67	No ground water	1.00
	Seepage	0.50				
RpA:						
Rossburg	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Thin layer	1.00	Depth to water	0.99
			Seepage	1.00	Cutbanks cave	0.50
RuB:						
Russell	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.39	No ground water	1.00
RuB2:						
Russell	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
Miamian	Not limited		Somewhat limited		Very limited	
			Thin layer	0.43	No ground water	1.00
SeA:						
Savona	Very limited		Very limited		Very limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
			Seepage	1.00		
			Thin layer	0.83		
SnA:						
Sloan	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00		
			Thin layer	0.83		
			Piping	0.50		
StA:						
Stonelick	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
			Seepage	0.18		
SvA:						
Sugarvalley	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Depth to saturated zone	1.00	Cutbanks cave	0.50
					Slow refill	0.28
			Thin layer	0.96		
			Piping	0.50		
SwA:						
Sugarvalley	Somewhat limited		Very limited		Somewhat limited	
	Seepage	0.50	Thin layer	1.00	Cutbanks cave	0.50
			Depth to saturated zone	1.00	Slow refill	0.28
Fincastle	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Depth to saturated zone	1.00	No ground water	1.00
			Thin layer	0.93		

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ThA:						
Thackery-----------	Very limited		Very limited		Somewhat limited	
	Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	0.50
			Thin layer	0.89		
			Piping	0.50		
ThB:						
Thackery-----------	Very limited		Somewhat limited		Somewhat limited	
	Seepage	1.00	Piping	0.50	Cutbanks cave	0.50
			Thin layer	0.16	Depth to water	0.25
			Depth to saturated zone	0.11		
Ud:						
Udorthents----------	Not rated		Not rated		Not rated	
W:						
Water---------------	Not rated		Not rated		Not rated	
WbA:						
Warsaw--------------	Very limited		Somewhat limited		Very limited	
	Seepage	1.00	Thin layer	0.33	No ground water	1.00
			Seepage	0.18		
WnA:						
Westland-----------	Very limited		Very limited		Very limited	
	Seepage	1.00	Ponding	1.00	Cutbanks cave	1.00
			Depth to saturated zone	1.00		
			Thin layer	0.96		
WyB:						
Wynn----------------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.09	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
WyB2:						
Wynn----------------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.17	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
WyC2:						
Wynn----------------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.34	Thin layer	1.00	No ground water	1.00
			Hard to compact	1.00		
WyD2:						
Wynn----------------	Somewhat limited		Very limited		Very limited	
	Depth to bedrock	0.17	Thin layer	1.00	No ground water	1.00
	Slope	0.03	Hard to compact	1.00		
XeA:						
Xenia---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.93	No ground water	1.00
			Depth to saturated zone	0.47		

Table 21.—Water Management, Part I—Continued

Map symbol and soil name	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
XeB:						
Xenia---------------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.47		
XeB2:						
Xenia---------------	Somewhat limited		Somewhat limited		Very limited	
	Seepage	0.50	Thin layer	0.80	No ground water	1.00
			Depth to saturated zone	0.47		
XfB:						
Xenia---------------	Somewhat limited		Very limited		Very limited	
	Seepage	0.50	Thin layer	1.00	No ground water	1.00
			Piping	0.50		
			Depth to saturated zone	0.47		

Table 21.—Water Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Grassed waterways		Terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
CeA:						
Celina	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99		
CeB, CeB2:						
Celina	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
CoA:						
Corwin	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Depth to saturated zone	1.00		
	Depth to saturated zone	0.86	Restricted permeability	0.91		
CtA, CtB:						
Crosby	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Restricted permeability	0.94		
Celina	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99		
CvA:						
Crosby	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Restricted permeability	0.94	Restricted permeability	0.94		
Lewisburg	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
CyA:						
Cyclone	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
DaA:						
Dana	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
DaB:						
Dana	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
					Slope	0.04
EeA:						
Eel	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.95	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
EgA:						
Eldean	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
EgB:						
Eldean	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
					Slope	0.04
EgB2:						
Eldean	Very limited		Very limited		Very limited	
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Content of large stones	0.01	Content of large stones	0.01	Depth to saturated zone	1.00
					Slope	0.04
EhC3:						
Eldean	Very limited		Very limited		Very limited	
	Slope	1.00	Too sandy	1.00	Cutbanks cave	1.00
	Droughty	1.00	Slope	1.00	Depth to saturated zone	1.00
	Content of large stones	0.01	Content of large stones	0.01	Slope	0.96
EhD3:						
Eldean	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
					Depth to saturated zone	1.00
EkA:						
Eldean	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
EkB, EkB2:						
Eldean	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
					Slope	0.04
FcA, FdA:						
Fincastle	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
FmA:						
Fox	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
			Too sandy	1.00		
FmB, FmB2:						
Fox	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
			Too sandy	1.00	Slope	0.04
HeF2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
HwE2:						
Hennepin	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
Wynn	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.46	Depth to soft bedrock	0.46	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Depth to bedrock	0.12

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways		Terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
HwF2:						
Hennepin------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
Wynn----------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.90	Depth to soft bedrock	0.90	Depth to bedrock	0.30
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
KeC2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
Eldean--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Cutbanks cave	1.00
	Slope	1.00	Too sandy	1.00	Depth to saturated zone	1.00
	Droughty	1.00	Slope	1.00	Slope	0.96
KeD2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
Eldean--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Cutbanks cave	1.00
			Too sandy	1.00	Depth to saturated zone	1.00
KnA, KoA:						
Kokomo--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
LeB:						
Lewisburg-----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91	Slope	0.04

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
LeB:						
Celina	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
LfB2:						
Lewisburg	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91	Slope	0.04
Celina	Somewhat limited		Very limited		Very limited	
	Restricted permeability	0.99	Depth to saturated zone	1.00	Frost action	1.00
	Depth to saturated zone	0.68	Restricted permeability	0.99	Restricted permeability	0.99
					Slope	0.04
LgC3:						
Lewisburg	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.91
	Restricted permeability	0.91	Restricted permeability	0.91		
LpA:						
Lippincott	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
			Too sandy	1.00	Cutbanks cave	1.00
MaA:						
Medway	Somewhat limited		Very limited		Very limited	
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Frost action	1.00
					Flooding	1.00
MbB2:						
Miami	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00	Slope	0.05
	Depth to saturated zone	0.24	Restricted permeability	0.99		
McE2:						
Miami	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
McE2:						
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
McF2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
MdC2:						
Miami---------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.99
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
MdD2:						
Miami---------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Restricted permeability	0.99
	Restricted permeability	0.99	Depth to saturated zone	1.00		
	Depth to saturated zone	0.24	Restricted permeability	0.99		
MeC, MeC2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
MeD2:						
Miamian-------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
MfB, MfB2:						
Miamian	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09			Slope	0.04
Celina	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Restricted permeability	0.99	Depth to saturated zone	1.00	Restricted permeability	0.99
	Depth to saturated zone	0.68	Restricted permeability	0.99	Slope	0.04
MgE2, MgF2:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
Kendallville	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22
MhC3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Slope	0.96
	Depth to saturated zone	0.09			Restricted permeability	0.91
Losantville	Very limited		Very limited		Very limited	
	Droughty	1.00	Depth to saturated zone	1.00	Slope	0.96
	Slope	1.00	Slope	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Restricted permeability	0.94		
	Restricted permeability	0.94				
MhD3:						
Miamian	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
	Depth to saturated zone	0.09			Restricted permeability	0.91

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
MhD3:						
Losantville---------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94
	Depth to saturated zone	1.00	Restricted permeability	0.94		
	Restricted permeability	0.94				
MmE2:						
Miamian------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09				
Hennepin-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
MnE3:						
Miamian------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
	Depth to saturated zone	0.09			Restricted permeability	0.91
Hennepin-----------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Depth to saturated zone	1.00
					Restricted permeability	0.91
MpA, MrA:						
Milford------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Restricted permeability	0.22	Ponding	1.00	Frost action	1.00
			Restricted permeability	0.22	Restricted permeability	0.22
MsA:						
Millsdale----------	Very limited		Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Frost action	1.00
	Restricted permeability	0.22	Depth to hard bedrock	0.84	Depth to bedrock	0.26
			Restricted permeability	0.22	Restricted permeability	0.22

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
MtA:						
Millsdale-----------	Very limited		Very limited		Very limited	
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Ponding	1.00
	Depth to saturated zone	1.00	Ponding	1.00	Frost action	1.00
	Restricted permeability	0.22	Depth to hard bedrock	0.46	Restricted permeability	0.22
			Restricted permeability	0.22	Depth to bedrock	0.12
MuA:						
Milton--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.35	Depth to bedrock	0.09
MuB, MuB2:						
Milton--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64	Depth to bedrock	0.17
					Slope	0.04
MuC2:						
Milton--------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Slope	1.00	Slope	0.96
	Slope	1.00	Depth to hard bedrock	0.64	Depth to bedrock	0.17
MuD2:						
Milton--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.54	Depth to bedrock	0.14
MuE2:						
Milton--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to hard bedrock	1.00	Depth to hard bedrock	0.95	Depth to bedrock	0.35
	Droughty	1.00				
MwA:						
Morningsun----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		
MxA:						
Morningsun----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00		

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
MxA:						
Xenia	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
MxB:						
Morningsun	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Depth to saturated zone	1.00	Slope	0.04
Xenia	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
MxB2:						
Morningsun	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.24	Too sandy	1.00	Slope	0.04
			Depth to saturated zone	1.00		
Xenia	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
MyA:						
Mahalasville	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
OcA:						
Ockley	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
OcB:						
Ockley	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
					Slope	0.04
Pg, Pq:						
Pits	Not rated		Not rated		Not rated	
PtB:						
Plattville	Somewhat limited		Not limited		Very limited	
	Depth to hard bedrock	0.13			Depth to saturated zone	1.00
	Depth to saturated zone	0.09			Slope	0.04

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways		Terraces and diversions		Drainage	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
RaA:						
Rainsville----------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	0.47	Depth to saturated zone	1.00		
	Restricted permeability	0.22	Restricted permeability	0.22		
RaB:						
Rainsville----------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Slope	0.05
	Depth to saturated zone	0.47	Depth to saturated zone	1.00		
RaB2:						
Rainsville----------	Very limited		Very limited		Somewhat limited	
	Water erosion	1.00	Water erosion	1.00	Restricted permeability	0.22
	Depth to saturated zone	0.47	Depth to saturated zone	1.00	Slope	0.05
	Restricted permeability	0.22	Restricted permeability	0.22		
RcA:						
Randolph------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Depth to saturated zone	1.00	Restricted permeability	0.22	Depth to bedrock	0.05
	Restricted permeability	0.22	Depth to hard bedrock	0.20		
RcB:						
Randolph------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to hard bedrock	1.00	Depth to saturated zone	1.00	Restricted permeability	0.22
	Depth to saturated zone	1.00	Depth to hard bedrock	0.29	Depth to bedrock	0.07
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04
RnE2, RnF2:						
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
RoE2, RoF2:						
Rodman--------------	Very limited		Very limited		Very limited	
	Slope	1.00	Slope	1.00	Slope	1.00
	Droughty	1.00	Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
Kendallville--------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
RpA:						
Rossburg-----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Flooding	1.00
			Too sandy	1.00	Depth to saturated zone	1.00
RuB, RuB2:						
Russell------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
					Depth to saturated zone	1.00
					Slope	0.04
Miamian------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.91	Restricted permeability	0.91	Restricted permeability	0.91
	Depth to saturated zone	0.09			Slope	0.04
SeA:						
Savona-------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
			Too sandy	1.00		
SnA:						
Sloan--------------	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
					Frost action	1.00
			Ponding	1.00	Flooding	1.00
StA:						
Stonelick----------	Not limited		Very limited		Very limited	
			Too sandy	1.00	Cutbanks cave	1.00
					Flooding	1.00
					Depth to saturated zone	1.00
SvA:						
Sugarvalley--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
SwA:						
Sugarvalley--------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Fincastle----------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
ThA:						
Thackery	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.96	Depth to saturated zone	1.00		
ThB:						
Thackery	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.09			Depth to saturated zone	1.00
					Slope	0.04
Ud:						
Udorthents	Not rated		Not rated		Not rated	
W:						
Water	Not rated		Not rated		Not rated	
WbA:						
Warsaw	Not limited		Very limited		Very limited	
			Too sandy	1.00	Cutbanks cave	1.00
					Depth to saturated zone	1.00
WnA:						
Westland	Very limited		Very limited		Very limited	
	Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
			Ponding	1.00	Frost action	1.00
WyB:						
Wynn	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Restricted permeability	0.40	Restricted permeability	0.40	Restricted permeability	0.40
	Depth to soft bedrock	0.35	Depth to soft bedrock	0.35	Depth to bedrock	0.09
					Slope	0.04
WyB2:						
Wynn	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.64	Depth to soft bedrock	0.64	Restricted permeability	0.40
	Restricted permeability	0.40	Restricted permeability	0.40	Depth to bedrock	0.17
					Slope	0.04
WyC2:						
Wynn	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	1.00
	Slope	1.00	Slope	1.00	Slope	0.96
	Depth to soft bedrock	0.95	Depth to soft bedrock	0.95	Depth to bedrock	0.35
	Restricted permeability	0.22	Restricted permeability	0.22	Restricted permeability	0.22

Table 21.—Water Management, Part II—Continued

Map symbol and soil name	Grassed waterways: Rating class and limiting features	Value	Terraces and diversions: Rating class and limiting features	Value	Drainage: Rating class and limiting features	Value
WyD2:						
Wynn----------------	Very limited		Very limited		Very limited	
	Slope	1.00	Water erosion	1.00	Slope	1.00
	Water erosion	1.00	Slope	1.00	Depth to saturated zone	1.00
	Depth to soft bedrock	0.64	Depth to soft bedrock	0.64	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Depth to bedrock	0.17
XeA:						
Xenia---------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22		
XeB, XeB2, XfB:						
Xenia---------------	Very limited		Very limited		Very limited	
	Water erosion	1.00	Water erosion	1.00	Frost action	1.00
	Depth to saturated zone	0.86	Depth to saturated zone	1.00	Restricted permeability	0.22
	Restricted permeability	0.22	Restricted permeability	0.22	Slope	0.04

Table 22.—Engineering Index Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CeA:												
Celina----------	0-10	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	10-36	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	36-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CeB:												
Celina----------	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	9-38	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	38-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CeB2:												
Celina----------	0-8	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	8-28	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	28-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CoA:												
Corwin----------	0-11	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	55-90	15-40	3-15
	11-38	Silt loam, clay loam, loam	CL, CL-ML	A-4, A-6, A-7-6	0	0-1	90-100	85-100	75-95	50-80	20-50	5-30
	38-80	Loam, silt loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-95	75-90	45-80	15-35	NP-15
CtA:												
Crosby----------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	1-15
	10-25	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	30-60	10-35
	25-39	Loam, clay loam	CL, ML, SC, SM	A-6, A-4	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
	39-80	Loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
CtA:												
Celina----------	0-8	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	8-34	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	34-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CtB:												
Crosby----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	1-15
	7-21	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	36-56	25-32
	21-32	Loam, clay loam	CL, ML, SC, SM	A-6, A-4	0-1	0-3	85-100	80-98	65-90	40-70	15-35	1-20
	32-80	Loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-35	1-20
Celina----------	0-10	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	10-39	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7, A-7-6	0	0	100	90-100	80-95	70-85	35-60	25-35
	39-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
CvA:												
Crosby----------	0-9	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	90-100	80-95	60-85	15-40	1-15
	9-28	Clay loam, silty clay loam, silty clay, clay	CH, CL	A-6, A-7-6	0-1	0-3	90-100	85-100	75-95	55-90	36-56	25-32
	28-36	Loam, clay loam	SC, SM, CL, ML	A-6, A-4	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
	36-80	Loam	CL, ML, SC, SM	A-4, A-6	0-1	0-3	85-100	80-98	65-90	40-70	15-35	2-20
Lewisburg-------	0-7	Silt loam	ML, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	7-19	Clay, clay loam, loam	CH, CL	A-6, A-7	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CyA:												
Cyclone----------	0-12	Silt loam	CL, ML	A-4, A-6	0	0	100	100	90-100	70-100	22-42	2-20
	12-50	Silty clay loam, clay loam	CL	A-4, A-6	0	0	100	100	90-100	80-95	33-45	9-21
	50-61	Clay loam, loam	CL	A-4, A-6	0	0	100	100	90-100	80-95	33-45	9-21
	61-80	Loam	CL-ML, ML	A-4	0	0	100	100	90-100	70-90	20-40	2-10
DaA:												
Dana-------------	0-11	Silt loam	ML	A-4, A-6	0	0	100	100	95-100	85-95	28-38	6-12
	11-38	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-98	38-47	19-25
	38-55	Loam, clay loam	CL, CL-ML	A-7, A-6	0	0-3	90-100	90-95	80-90	65-75	22-42	2-20
	55-80	Loam	CL, CL-ML, SM	A-4, A-6	0-3	0-3	85-95	80-90	75-85	40-65	20-30	2-16
DaB:												
Dana-------------	0-10	Silt loam	ML	A-4, A-6	0	0	100	100	95-100	85-95	28-47	6-12
	10-37	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-98	38-47	19-25
	37-48	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-3	90-100	90-95	80-90	35-55	22-42	2-20
	48-80	Loam	SM, CL, CL-ML	A-4, A-6	0-3	0-3	85-95	80-90	75-85	35-60	16-26	3-12
EeA:												
Eel--------------	0-13	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-38	2-12
	13-37	Loam, silt loam, clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	70-85	18-39	2-17
	37-48	Loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0	100	90-100	55-95	30-80	20-40	2-20
	48-80	Gravelly sandy loam, gravelly loam, gravelly fine sandy loam	GP-GM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	24-30	NP-12

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
EgA:												
Eldean----------	0-4	Gravelly loam	CL-ML, GM, ML, SM	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	4-24	Clay, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7, A-7-6	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	24-30	Very gravelly clay loam, very gravelly sandy loam, very gravelly loam, gravelly sandy loam, loam, sandy clay loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-44	9-25
	30-80	Stratified very gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4
EgB:												
Eldean----------	0-4	Gravelly loam	GM, ML, SM, CL-ML	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	4-22	Clay, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7, A-7-6	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	22-30	Very gravelly clay loam, very gravelly sandy loam, very gravelly loam, gravelly sandy loam, loam, sandy clay loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-44	9-25
	30-80	Stratified very gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EgB2:												
Eldean----------	0-4	Gravelly loam	GM, ML, SM, CL-ML	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	4-20	Clay, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7, A-7-6	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	20-26	Very gravelly clay loam, very gravelly sandy loam, very gravelly loam, gravelly sandy loam, loam, sandy clay loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-44	9-25
	26-80	Stratified very gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4
EhC3:												
Eldean----------	0-5	Gravelly clay loam	CL-ML, GM, ML, SM	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	5-16	Gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	12-24
	16-22	Very gravelly clay loam, gravelly sandy loam, very gravelly loam, loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-61	9-39
	22-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EhD3:												
Eldean----------	0-5	Gravelly clay loam	CL-ML, GM, ML, SM	A-4, A-6	0	0-10	65-90	60-80	55-75	40-60	20-50	2-16
	5-28	Gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	12-24
	28-35	Very gravelly clay loam, gravelly sandy loam, very gravelly loam, loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	25-61	9-39
	35-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-21	NP-4
EkA:												
Eldean----------	0-9	Loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	9-28	Clay loam, loam, clay, gravelly clay loam, gravelly clay, silt loam, silty clay loam	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	28-36	Gravelly clay loam, very gravelly coarse sandy loam, gravelly loam, very gravelly loam	CL, GC, SC	A-4, A-2, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	26-45	9-25
	36-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EkB:												
Eldean----------	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	7-28	Clay, clay loam, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	75-100	60-100	55-95	50-80	35-55	10-30
	28-34	Gravelly clay loam, gravelly sandy loam, gravelly loam, loam	CL, GC, SC	A-4, A-2, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	26-45	9-25
	34-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
EkB2:												
Eldean----------	0-5	Loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	5-24	Clay, clay loam, gravelly clay loam, gravelly clay	CL, ML	A-6, A-7	0	0-5	80-100	48-100	43-100	35-86	35-55	10-30
	24-32	Gravelly clay loam, gravelly sandy loam, very gravelly loam, loam	CL, GC, SC	A-4, A-2, A-6, A-7	0	0-10	55-85	45-85	45-75	30-60	26-45	9-25
	32-80	Stratified very gravelly coarse sandy loam to extremely gravelly loamy coarse sand	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
FcA:												
Fincastle-------	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-93	22-42	2-20
	9-35	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	33-46	16-25
	35-46	Clay loam, loam, silty clay loam	CL, CL-ML	A-6	0	0-5	90-100	85-95	70-95	50-80	16-26	4-12
	46-80	Loam	CL, CL-ML	A-4, A-6	0	0-3	88-96	82-90	70-86	50-66	16-26	4-12
FdA:												
Fincastle-------	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	95-100	90-100	75-93	22-42	2-20
	9-36	Silt loam, silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	33-46	16-25
	36-43	Clay loam	CL, CL-ML	A-6	0	0-5	90-100	85-95	70-95	50-80	16-26	4-12
	43-63	Loam, flaggy loam	CL, CL-ML	A-4, A-6	0	0-3	88-96	82-90	70-86	50-66	16-26	4-12
	63-67	Weathered bedrock			---	---	---	---	---	---	---	---
FmA:												
Fox-------------	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	16-36	2-12
	10-37	Clay loam, loam, gravelly loam, gravelly clay loam, gravelly sandy clay loam	CL, GC, SC	A-2, A-6, A-7	0	0-5	75-100	60-100	55-95	20-70	29-46	12-25
	37-64	Extremely gravelly loamy sand, very gravelly loamy sand, gravelly loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
	64-80	Loam	CL	A-6, A-7	0	0	95-100	95-100	85-95	50-75	29-46	12-25

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
FmB:												
Fox	0-10	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	16-36	2-12
	10-37	Clay loam, loam, gravelly loam, gravelly clay loam, gravelly sandy clay loam, very gravelly sandy loam	CL, GC, SC	A-2, A-6, A-7	0	0-5	75-100	60-100	55-95	20-70	29-46	12-25
	37-65	Extremely gravelly loamy sand, very gravelly loamy sand, gravelly loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
	65-80	Loam	CL	A-6, A-7	0-1	0-5	95-100	95-100	85-95	50-75	29-46	12-25
FmB2:												
Fox	0-8	Silt loam	CL, CL-ML, ML	A-4	0	0	95-100	95-100	85-95	65-90	16-36	2-12
	8-38	Clay loam, loam, gravelly loam, gravelly clay loam	CL, GC, SC	A-2, A-6, A-7	0	0-5	75-100	60-100	55-95	20-70	29-46	12-25
	38-72	Extremely gravelly loamy sand, very gravelly loamy sand, gravelly loamy sand, very gravelly sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
	72-80	Loam	CL	A-6, A-7	0-1	0-5	95-100	95-100	85-95	50-75	29-46	12-25
HeF2:												
Hennepin	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-16	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	16-80	Loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
HeF2:												
Miamian---------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	22-42	2-18
	4-19	Clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	19-29	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	29-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	18-38	4-12
HwE2:												
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-16	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	16-80	Loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
Wynn------------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	5-30	Silty clay loam, clay, silty clay, clay loam	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	30-33	Weathered bedrock			---	---	---	---	---	---	---	---
HwF2:												
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-13	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	13-80	Loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
Wynn------------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	4-24	Silty clay loam, clay loam, silty clay, clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	24-27	Weathered bedrock			---	---	---	---	---	---	---	---
KeC2:												
Kendallville----	0-5	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	5-30	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	30-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
KeC2:												
Eldean----------	0-5	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	5-26	Clay, gravelly clay loam, clay loam	CL, ML	A-6, A-7	0	0-5	75-100	60-100	55-95	50-80	35-55	10-30
	26-80	Stratified gravelly loamy coarse sand to gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
KeD2:												
Kendallville----	0-3	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	3-32	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	32-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
Eldean----------	0-4	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	85-100	80-100	70-100	55-90	20-45	2-20
	4-33	Clay, gravelly clay loam, clay loam	CL, ML	A-6, A-7	0	0-5	75-100	60-100	55-95	50-80	35-55	10-30
	33-80	Stratified very gravelly loamy coarse sand to extremely gravelly coarse sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0	0-15	30-70	20-50	5-40	0-35	0-22	NP-4
KnA:												
Kokomo----------	0-10	Silt loam	CL	A-6	0	0	100	98-100	85-100	60-90	37-51	13-19
	10-50	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	38-58	21-32
	50-68	Silty clay loam, clay loam, silty clay, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	38-58	21-32
	68-80	Loam	CL	A-6	0-1	0-3	90-100	85-95	75-90	55-70	24-39	9-21

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
KoA:												
Kokomo----------	0-11	Silty clay loam	CH, CL	A-6, A-7	0	0	100	98-100	85-95	75-85	38-58	18-24
	11-41	Silty clay loam, clay loam, silty clay	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	33-53	25-29
	41-64	Silty clay loam, clay loam, silty clay, loam	CH, CL	A-6, A-7	0	0-1	95-100	95-100	95-100	75-95	38-58	21-32
	64-80	Loam	CL	A-6	0-1	0-3	90-100	85-95	75-90	55-70	24-39	9-21
LeB:												
Lewisburg-------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	9-19	Clay loam, clay, loam	CH, CL	A-6, A-7	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12
Celina----------	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	9-34	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	35-60	25-35
	34-80	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
LfB2:												
Lewisburg-------	0-6	Clay loam	ML, CL-ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	6-19	Clay loam, clay	CL, CH	A-7, A-6	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12
Celina----------	0-8	Clay loam	ML	A-4, A-6	0	0	100	90-100	90-100	70-85	31-54	8-28
	8-30	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	38-58	25-35
	30-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
LgC3:												
Lewisburg-------	0-4	Clay loam	CL-ML, ML	A-4, A-6	0	0-2	95-100	90-100	85-100	75-90	20-40	2-12
	4-19	Clay loam, clay	CH, CL	A-6, A-7	0	0-2	90-100	85-95	80-95	65-85	35-60	25-35
	19-80	Loam, silt loam	CL-ML, CL	A-4, A-6	0	0-5	85-100	80-95	65-90	50-75	15-25	4-12

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
LpA:												
Lippincott------	0-11	Silty clay loam	CL, ML	A-6, A-7	0	0	90-100	80-100	75-100	70-95	25-45	2-20
	11-25	Silty clay, clay, clay loam, silty clay loam	CH, CL, MH, ML	A-6, A-7	0	0	90-100	80-100	75-100	60-95	20-60	3-20
	25-36	Very gravelly sandy loam, gravelly coarse sandy loam, very gravelly silt loam, gravelly clay loam, loam	GM, GP-GM, SM, SP-SM	A-2, A-1, A-6, A-4	0	0-10	40-65	20-55	10-50	5-40	17-47	2-24
	36-80	Very gravelly loamy sand, extremely gravelly sand, extremely gravelly loamy coarse sand	GP, GW, SM, SP	A-1	0	0-10	40-65	20-55	10-40	1-20	0-22	NP-6
MaA:												
Medway----------	0-12	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	70-90	20-50	2-25
	12-38	Loam, silt loam, clay loam, silty clay loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	95-100	80-95	75-90	70-90	20-50	2-25
	38-80	Stratified gravelly sandy loam to silt loam to silty clay loam, stratified gravelly loam to clay loam	CL, ML, SC, SM	A-1-b, A-2, A-4, A-6	0	0-5	80-100	50-100	30-95	15-75	17-40	2-21

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MbB2:												
Miami-----------	0-5	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	20-40	3-18
	5-23	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	23-30	Clay loam, loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	24-39	3-20
	30-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13
McE2:												
Miami-----------	0-5	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	20-40	3-18
	5-22	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	22-31	Loam, fine sandy loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	24-36	3-17
	31-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13
Kendallville----	0-5	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	5-31	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	31-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
McF2:												
Miami-----------	0-4	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	20-40	3-18
	4-10	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0-1	95-100	92-100	85-98	75-90	25-45	5-25
	10-22	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	22-28	Loam, fine sandy loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	24-36	3-17
	28-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
McF2:												
Kendallville----	0-4	Silt loam	ML	A-6, A-4	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	4-40	Clay loam, silty clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	40-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
MdC2:												
Miami-----------	0-5	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	22-42	2-20
	5-20	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	20-26	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	29-40	3-21
	26-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	75-95	75-90	65-85	40-70	20-32	3-13
MdD2:												
Miami-----------	0-5	Loam	ML, CL, CL-ML	A-4, A-6	0	0	95-100	92-100	85-100	75-90	22-42	2-20
	5-24	Clay loam, silty clay loam	CL	A-6, A-7-6	0-1	0-5	90-100	85-98	75-95	55-85	37-46	19-25
	24-30	Loam, clay loam	CL, ML, SC, SM	A-4, A-6	0-1	0-5	90-98	85-98	65-95	40-70	29-40	3-21
	30-80	Loam, fine sandy loam, gravelly loam	CL, ML, SC, SM	A-6, A-4	0-1	0-5	90-98	85-98	65-90	40-70	20-32	3-13
MeC:												
Miamian---------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	9-12	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	12-24	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	24-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
MeC2:												
Miamian---------	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	6-18	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	18-29	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	29-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
MeD2:												
Miamian---------	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	6-22	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	22-27	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	27-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
MfB:												
Miamian---------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	9-29	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	29-35	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	35-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Celina----------	0-10	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	10-34	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	38-58	25-35
	34-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
MfB2:												
Miamian---------	0-9	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	9-24	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	24-36	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	36-80	Loam, gravelly loam	ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MfB2:												
Celina----------	0-9	Silt loam	ML	A-4	0	0	100	90-100	90-100	70-85	22-42	2-12
	9-33	Silt loam, loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	100	90-100	80-95	70-85	38-58	25-35
	33-80	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	75-95	75-90	65-90	50-80	15-25	4-12
MgE2:												
Miamian---------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	4-28	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	28-38	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	38-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Kendallville----	0-4	Silt loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	4-29	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	29-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20
MgF2:												
Miamian---------	0-6	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	6-23	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	23-28	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	28-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Kendallville----	0-4	Silt loam	ML	A-6, A-4	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	4-35	Clay loam, gravelly silty clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	35-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MhC3:												
Miamian---------	0-4	Clay loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	4-19	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	19-26	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	26-80	Loam, gravelly loam	ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-18
Losantville-----	0-3	Clay loam	CL, CL-ML, ML	A-4, A-6	0	0-2	90-100	85-100	80-95	50-85	22-42	2-20
	3-19	Loam, clay loam	CH, CL	A-7, A-7-6, A-6	0	0-2	90-100	80-98	75-95	55-80	35-55	25-32
	19-80	Loam	CL, ML, SM, SC	A-4, A-6	0	0-5	100	80-95	75-90	45-70	20-35	2-20
MhD3:												
Miamian---------	0-3	Clay loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	3-26	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	26-33	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	33-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Losantville-----	0-3	Clay loam	CL, CL-ML, ML	A-4, A-6	0	0-2	90-100	85-100	80-95	50-85	22-42	2-20
	3-14	Loam, clay loam	CH, CL	A-7, A-7-6, A-6	0	0-2	90-100	80-98	75-95	55-80	35-55	25-32
	14-80	Loam	CL, SC, SM, ML	A-4, A-6	0	0-5	100	80-95	75-90	45-70	20-35	2-20
MmE2:												
Miamian---------	0-3	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	3-18	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	18-26	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	26-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Hennepin--------	0-4	Silt loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-19	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	19-80	Loam, gravelly loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MnE3:												
Miamian---------	0-3	Clay loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	3-18	Clay, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	18-26	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	26-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
Hennepin--------	0-4	Clay loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	36-49	17-25
	4-18	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	35-46	17-25
	18-80	Loam, gravelly loam	CL-ML	A-4, A-6	0	0-5	95-100	95-100	65-85	50-75	20-37	6-19
MpA:												
Milford---------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-60	21-27
	10-34	Silty clay loam, clay loam, silty clay	CL	A-7	0	0	100	95-100	85-100	60-95	44-59	25-33
	34-46	Silty clay loam, clay loam, silty clay, silt loam	CL	A-7	0	0	100	95-100	85-100	60-95	44-57	25-30
	46-80	Stratified silt loam to silty clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	50-95	50-80	21-41	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
MrA:												
Milford---------	0-11	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-60	21-27
	11-24	Silty clay loam, clay loam, silty clay	CL	A-7	0	0	100	95-100	85-100	60-95	44-59	25-33
	24-46	Silty clay loam, clay loam, silty clay, silt loam	CL	A-7	0	0	100	95-100	85-100	60-95	44-57	25-30
	46-73	Silt loam, fine sandy loam, very gravelly loamy sand, stratified sandy loam to loamy sand to silty clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	50-95	50-80	0-40	NP-20
	73-80	Very gravelly loamy sand, gravelly loamy sand	GP, GP-GM, SP, SP-SM	A-2, A-3, A-1	0-3	0-10	30-100	20-95	10-90	2-10	0-14	NP
MsA:												
Millsdale-------	0-16	Silt loam	CL	A-6, A-7	0	0	90-100	80-100	75-100	70-95	38-58	15-30
	16-25	Silty clay, clay, clay loam	CH, CL	A-7	0	0-5	85-100	80-100	75-100	60-95	46-59	25-33
	25-32	Unweathered bedrock			---	---	---	---	---	---	---	---
MtA:												
Millsdale-------	0-14	Silty clay loam	CL	A-6, A-7	0	0	90-100	80-100	75-100	70-95	35-60	18-22
	14-30	Silty clay, clay, clay loam	CH, CL	A-7	0	0-5	85-100	80-100	75-100	60-95	46-59	25-33
	30-38	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MuA:												
Milton----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	16-26	3-13
	9-31	Clay loam, loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	35-54	17-32
	31-60	Unweathered bedrock			---	---	---	---	---	---	---	---
MuB:												
Milton----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	16-26	3-13
	9-28	Clay loam, loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	35-54	17-32
	28-60	Unweathered bedrock			---	---	---	---	---	---	---	---
MuB2:												
Milton----------	0-5	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	5-24	Clay loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	35-60	25-36
	24-28	Clay, loam, clay loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	28-35	Unweathered bedrock			---	---	---	---	---	---	---	---
MuC2:												
Milton----------	0-3	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	3-25	Clay loam, clay, silty clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	38-58	25-35
	25-28	Clay loam, loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	28-35	Unweathered bedrock			---	---	---	---	---	---	---	---
MuD2:												
Milton----------	0-5	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	5-25	Silty clay loam, clay loam, clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	38-58	25-35
	25-29	Loam, clay loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	29-36	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MuE2:												
Milton----------	0-4	Silt loam	CL, ML	A-4, A-6	0	0	95-100	90-100	85-100	70-95	26-46	8-18
	4-16	Clay loam, clay	CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	38-58	25-35
	16-23	Loam, clay, clay loam	CH, CL	A-6, A-7	0	0-5	95-100	80-100	70-95	50-90	35-54	17-32
	23-35	Unweathered bedrock			---	---	---	---	---	---	---	---
MwA:												
Morningsun------	0-10	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	10-33	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	33-42	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	42-51	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	51-80	Loam, sandy loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
MxA:												
Morningsun------	0-11	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	11-38	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	38-45	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	45-58	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	58-80	Loam, sandy loam, gravelly loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18
Xenia-----------	0-9	Silt loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-30	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	37-47	19-25
	30-45	Silt loam, clay loam, loam	CL-ML, CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	45-80	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MxB:												
Morningsun------	0-10	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	10-34	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	34-48	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	48-80	Loam, sandy loam, gravelly loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18
Xenia-----------	0-9	Silt loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-30	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	37-47	19-25
	30-50	Silt loam, clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	50-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
MxB2:												
Morningsun------	0-6	Silt loam	ML	A-4, A-6, A-7	0	0	100	100	95-100	95-100	27-43	2-14
	6-26	Silt loam, silty clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	26-31	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	31-50	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0-1	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	50-80	Loam, sandy loam, gravelly loam, gravelly sandy loam, stratified gravelly loam to sandy loam to loamy sand	CL, CL-ML	A-4, A-6	0-1	0-5	80-100	50-100	45-90	27-70	22-42	6-18
Xenia-----------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	5-28	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	37-47	19-25
	28-45	Silt loam, clay loam, loam	CL-ML, CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	45-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
MyA:												
Mahalasville----	0-12	Silt loam	CH, CL, ML	A-6, A-7-6	0	0	100	100	95-100	85-100	35-55	10-30
	12-39	Silty clay loam, silt loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	40-55	20-40
	39-44	Sandy loam, loam, silt loam	CL, CL-ML, SC, SC-SM	A-6, A-7	0-1	0	85-100	75-98	55-90	40-65	20-60	5-30
	44-80	Silt loam, loam, gravelly sand, gravelly sandy loam, gravelly loam, stratified sand to silt loam	SM, SP-SM	A-2-4	0-1	0	85-100	75-100	40-60	10-60	0-0	NP

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
OcA:												
Ockley----------	0-9	Silt loam	CL-ML, ML	A-4	0	0	95-100	85-100	70-100	50-90	22-42	2-20
	9-48	Clay loam, sandy clay loam, gravelly sandy clay loam	CL, SC	A-2, A-4, A-6	0	0-2	75-100	60-100	55-95	20-70	35-45	9-29
	48-80	Stratified very gravelly sand to gravelly loamy sand	GP-GM, SP	A-1	0	1-5	30-70	20-55	10-40	2-10	0-19	NP-3
OcB:												
Ockley----------	0-9	Silt loam	CL-ML, ML	A-4	0	0	95-100	85-100	70-100	50-90	22-42	2-20
	9-50	Clay loam, sandy clay loam, gravelly sandy clay loam, gravelly clay loam	CL, SC	A-2, A-4, A-6	0	0-2	75-100	60-100	55-95	20-70	35-45	9-29
	50-80	Stratified very gravelly sand to very gravelly loamy sand	GP-GM, SP	A-1	0	1-5	30-70	20-55	10-40	2-10	0-19	NP-3
Pg, Pq. Pits												
PtB:												
Plattville------	0-18	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0-1	98-100	95-100	90-100	55-90	22-42	2-20
	18-43	Clay loam, loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0-1	90-100	85-100	75-95	50-80	25-45	4-20
	43-54	Loam, clay loam, clay	CL, ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-95	75-90	45-80	20-35	2-20
	54-57	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RaA:												
Rainsville------	0-8	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-90	20-41	3-17
	8-15	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-90	24-44	4-24
	15-35	Clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-1	85-100	75-98	55-90	40-65	24-44	6-18
	35-55	Clay loam, sandy clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-2-6	0	0-1	85-100	75-98	45-90	20-60	24-44	6-18
	55-80	Loam, gravelly sandy loam, gravelly loam	CL, CL-ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-98	65-90	40-70	24-33	3-15
RaB:												
Rainsville------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-90	20-41	3-17
	10-16	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-90	24-44	4-24
	16-44	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-1	85-100	75-98	55-90	40-65	24-44	6-18
	44-50	Clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-2-6	0	0-1	85-100	75-98	45-90	20-60	24-44	6-18
	50-80	Loam, gravelly sandy loam, gravelly loam	CL, CL-ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-98	65-90	40-70	24-33	3-15
RaB2:												
Rainsville------	0-6	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	75-90	20-41	3-17
	6-36	Clay loam, loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-1	85-100	75-98	55-90	40-65	24-44	4-24
	36-52	Clay loam, gravelly clay loam, loam	CL, CL-ML, SC, SC-SM	A-6, A-2-6	0	0-1	85-100	75-98	45-90	20-60	24-44	6-18
	52-80	Loam, gravelly sandy loam, gravelly loam	CL, CL-ML, SC, SM	A-4, A-6	0-1	0-3	90-100	85-98	65-90	40-70	24-33	3-15

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RcA:												
Randolph--------	0-10	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	75-85	20-38	2-12
	10-27	Silty clay, clay loam, silty clay loam	CH, CL	A-6, A-7	0	0-5	75-95	75-95	75-85	70-80	35-60	25-36
	27-33	Clay, clay loam, silty clay loam, gravelly clay loam	CL, GC, SC	A-2, A-4, A-6	0	0-5	75-95	75-95	75-85	35-80	27-44	8-18
	33-35	Unweathered bedrock			---	---	---	---	---	---	---	---
RcB:												
Randolph--------	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	75-85	20-38	2-12
	8-23	Silty clay, clay loam, silty clay loam, clay	CH, CL	A-6, A-7	0	0-5	75-95	75-95	75-85	70-80	35-60	25-36
	23-32	Gravelly clay loam, clay loam	CL, GC, SC	A-2, A-4, A-6	0	0-5	75-95	75-95	75-85	35-80	27-44	8-18
	32-35	Unweathered bedrock			---	---	---	---	---	---	---	---

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
RnE2:												
Rodman----------	0-8	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	8-12	Gravelly loam, sandy loam, loam, gravelly sandy loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Extremely gravelly loamy coarse sand, extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly loamy sand, stratified extremely gravelly coarse sand to sand	GP, GP-GM, SP, SP-SM	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
RnF2:												
Rodman----------	0-4	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	4-12	Gravelly loam, sandy loam, loam, gravelly sandy loam, very gravelly loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Extremely gravelly loamy coarse sand, extremely gravelly loamy sand, extremely gravelly sandy loam, very gravelly sandy loam, stratified extremely gravelly coarse sand to sand	GP, GP-GM, SP, SP-SM	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
RoE2:												
Rodman----------	0-8	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	8-12	Gravelly loam, sandy loam, loam, gravelly sandy loam, very gravelly loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Very gravelly sandy loam, extremely gravelly loamy sand, extremely gravelly sandy loam, stratified extremely gravelly coarse sand to sand	SP-SM, GP, GP-GM, SP	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6
Kendallville----	0-12	Loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	12-49	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	49-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
RoF2:												
Rodman----------	0-4	Gravelly loam	CL, ML, SC, SM	A-4	0	0-2	70-85	65-75	60-75	36-65	23-43	2-20
	4-12	Gravelly loam, sandy loam, loam, gravelly sandy loam, very gravelly loam	CL, ML, SC, SM	A-1, A-2, A-4	0	0-2	70-85	60-85	40-75	20-55	16-39	2-17
	12-80	Extremely gravelly loamy sand, stratified extremely gravelly coarse sand to sand, stratified very gravelly loamy coarse sand to extremely gravelly loamy coarse sand to very gravelly sandy loam	GP, GP-GM, SP, SP-SM	A-1	0-1	1-5	30-70	20-55	7-20	2-10	0-24	NP-6
Kendallville----	0-7	Loam	ML	A-4, A-6	0	0-5	90-100	80-100	75-95	70-90	20-40	2-12
	7-40	Clay loam, gravelly clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	20-35	2-20
	40-80	Loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-40	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
RpA:												
Rossburg--------	0-18	Silt loam	CL-ML, CL	A-4, A-6	0	0	95-100	90-100	80-100	60-90	20-35	5-15
	18-35	Silt loam, loam, fine sandy loam, sandy loam	CL, CL-ML	A-4, A-6	0	0	90-100	85-100	70-95	50-80	20-35	5-15
	35-52	Gravelly loam, very gravelly sandy loam, loam, gravelly sandy loam, fine sandy loam, loamy sand, sandy loam, gravelly loamy sand, silt loam	SM, CL, CL-ML, ML	A-2-4, A-4	0	0	85-100	75-100	60-90	20-70	17-31	2-10
	52-80	Sand, gravelly sand, very gravelly sand, extremely gravelly sand	SP, SP-SM, SM	A-2, A-3	0	0	55-90	50-90	20-60	3-15	0-20	NP-6
RuB:												
Russell---------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-16
	8-35	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	36-47	17-25
	35-58	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-95	80-90	60-80	33-47	16-25
	58-80	Loam, gravelly loam	CL, CL-ML	A-4, A-6	0	0-5	70-90	65-85	60-75	50-65	20-30	4-12
Miamian---------	0-5	Silt loam	ML, CL-ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	5-10	Silt loam, clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	10-32	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	32-80	Loam, gravelly loam	ML, CL-ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
RuB2:												
Russell---------	0-6	Silt loam	ML, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-16
	6-32	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	36-47	17-25
	32-50	Clay loam, loam, silty clay loam	CL	A-6, A-7	0	0	95-100	90-95	80-90	60-80	33-47	16-25
	50-80	Loam, gravelly loam	CL, CL-ML	A-4, A-6	0	0-3	85-95	80-90	75-85	50-65	20-30	4-12
Miamian---------	0-4	Silt loam	CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	70-95	20-45	2-20
	4-26	Clay loam, silty clay loam	CL	A-6, A-7	0	0	85-100	80-100	75-95	70-85	36-47	17-25
	26-33	Clay loam, loam	CL	A-6, A-7	0	0-5	85-100	80-100	75-95	70-85	38-58	25-35
	33-80	Loam, gravelly loam	CL-ML, ML	A-4, A-6	0	0-5	75-95	75-90	65-85	50-75	17-37	2-20
SeA:												
Savona----------	0-7	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	95-100	95-100	90-100	75-90	20-30	2-16
	7-29	Clay loam, clay, silty clay loam, gravelly clay, gravelly clay loam, silt loam	CH, CL	A-6, A-7	0	0-5	75-100	65-90	60-80	45-75	32-52	25-30
	29-45	Gravelly loam, gravelly silt loam, gravelly sandy loam, very gravelly loam, very gravelly silt loam, very gravelly sandy loam	CL, GC, SC	A-2, A-4, A-6, A-7	0	0-10	65-80	50-75	40-70	25-55	24-52	9-32
	45-80	Very gravelly loamy coarse sand, very gravelly coarse sand, very gravelly sand	SP, SP-SM	A-1	0	5-25	30-70	20-60	10-40	2-10	0-0	NP-3

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SnA:												
Sloan-----------	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	70-95	25-45	4-18
	10-45	Silty clay loam, clay loam, silt loam, loam	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	90-100	85-100	75-95	25-45	4-18
	45-60	Gravelly sandy loam, clay loam, gravelly loam, loam	CL, ML, SM	A-4, A-6	0	0-5	74-100	31-100	21-85	11-55	21-41	2-20
	60-80	Sand, gravelly sand, very gravelly loamy coarse sand, loamy sand	SM, SP, SP-SM	A-3, A-2	0	0-5	55-90	50-90	20-60	3-15	0-20	NP-6
StA:												
Stonelick-------	0-10	Loam	CL-ML, ML	A-4	0	0	90-100	80-100	65-95	50-75	21-36	2-12
	10-30	Loamy sand, sandy loam, fine sandy loam, loam	SC-SM, SM, SP-SM	A-2-4, A-4	0	0	90-100	80-100	50-80	10-50	16-29	2-12
	30-80	Very gravelly loamy sand, gravelly loamy coarse sand, gravelly loamy sand, gravelly sand	GP, GP-GM, SP, SP-SM	A-1	0	0-5	30-70	20-55	10-25	2-10	15-22	1-6

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
SvA:												
Sugarvalley-----	0-10	Silt loam	CL-ML, ML	A-4	0	0	100	90-100	90-100	85-100	22-42	2-18
	10-41	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	90-100	90-100	90-100	24-44	2-20
	41-51	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	51-61	Sandy loam, loam, clay loam, gravelly sandy loam, gravelly loam, gravelly clay loam	CL, ML	A-6, A-7	0	0-5	80-100	50-100	45-90	27-70	25-55	8-18
	61-80	Gravelly loam, gravelly sandy loam, gravelly silt loam, sandy loam, loam, stratified silt loam to clay loam to loamy sand	CL-ML, ML	A-4, A-6	0	0-5	80-100	50-100	45-90	27-70	22-35	2-16
SwA:												
Sugarvalley-----	0-9	Silt loam	CL-ML, ML	A-4	0	0	100	90-100	90-100	85-100	22-42	2-18
	9-30	Silty clay loam, silt loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	90-100	90-100	90-100	24-44	2-20
	30-50	Silt loam, loam, clay loam	ML	A-4, A-6	0	0	100	100	100	95-100	30-41	2-14
	50-80	Sandy loam, loam, gravelly loam, gravelly sandy loam, gravelly silt loam, stratified silt loam to clay loam to loamy sand	CL-ML, ML	A-4, A-6	0	0	90-100	85-95	80-90	70-90	22-35	2-16

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SwA:												
Fincastle-------	0-11	Silt loam	CL, CL-ML, ML	A-4	0	0	100	95-100	90-100	75-93	22-42	2-20
	11-32	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	33-46	16-25
	32-48	Clay loam, loam, silty clay loam	CL	A-6	0	0	95-100	90-98	85-95	75-85	16-26	4-12
	48-80	Loam	CL	A-4, A-6	0	0-3	88-96	82-90	70-86	50-66	16-26	4-12
ThA:												
Thackery--------	0-12	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	90-100	85-100	70-90	22-42	2-16
	12-21	Silt loam, silty clay loam	CL, CL-ML, ML	A-4, A-6	0	0	100	90-100	80-95	65-90	22-42	2-16
	21-54	Clay loam, sandy clay loam, gravelly clay loam	CL, SC	A-4, A-6	0	0-2	80-100	75-95	70-85	45-75	35-41	8-18
	54-80	Gravelly loamy coarse sand, very gravelly loamy coarse sand, gravelly loamy sand	GM, GW	A-1	0	0-5	25-55	15-45	10-35	2-25	0-24	NP-7
ThB:												
Thackery--------	0-12	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	90-100	85-100	70-90	22-42	2-16
	12-67	Clay loam, sandy clay loam, gravelly clay loam	CL, SC	A-4, A-6	0	0-2	80-100	75-95	70-85	45-75	35-41	8-18
	67-80	Gravelly loamy coarse sand, very gravelly loamy coarse sand, gravelly loamy sand	GM, GW	A-1	0	0-5	25-55	15-45	10-35	2-25	0-24	NP-7
Ud. Udorthents												
W. Water												

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WbA:												
Warsaw----------	0-12	Loam	CL, CL-ML	A-4, A-6	0	0	85-100	85-100	70-100	50-90	25-45	4-18
	12-21	Silty clay loam, loam, clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-3	90-100	85-100	60-90	30-70	25-45	4-22
	21-30	Gravelly sandy clay loam, gravelly clay loam	CL, GC, SC, SC-SM	A-2-4, A-2-6, A-4, A-6	0	0-5	70-90	60-85	55-70	30-60	28-43	9-17
	30-80	Stratified very gravelly coarse sand to sand, stratified gravelly coarse sand to very gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1	0	1-5	30-70	22-55	7-20	2-10	0-22	NP-4
WnA:												
Westland--------	0-12	Silt loam	CH, CL, MH, ML	A-6, A-7-6	0	0	90-100	90-100	85-100	75-95	32-52	6-32
	12-20	Clay loam, loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	95-100	95-100	25-85	15-70	22-42	4-20
	20-51	Gravelly sandy loam, gravelly loam, gravelly clay loam, clay loam, gravelly sandy clay loam, sandy clay loam	CL, ML, SC, SM	A-2-4, A-4, A-6	0	0-5	55-100	45-95	25-85	15-70	17-47	2-24
	51-80	Gravelly coarse sand, stratified gravelly loamy coarse sand to very gravelly loamy coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-1-b	0	0-12	40-75	35-70	10-45	0-10	0-23	NP-6

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
WyB:												
Wynn------------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	8-14	Silty clay loam	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	14-31	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	40-60	21-35
	31-35	Weathered bedrock			---	---	---	---	---	---	---	---
WyB2:												
Wynn------------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	8-23	Silty clay loam	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	23-28	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	40-60	21-35
	28-38	Weathered bedrock			---	---	---	---	---	---	---	---
WyC2:												
Wynn------------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	5-23	Clay, clay loam, silty clay loam, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	23-38	Weathered bedrock			---	---	---	---	---	---	---	---
WyD2:												
Wynn------------	0-5	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	85-100	80-90	16-36	2-12
	5-28	Silty clay loam, clay loam, clay, silty clay	CH, CL	A-6, A-7	0	0	95-100	80-100	75-100	70-95	39-55	21-35
	28-38	Weathered bedrock			---	---	---	---	---	---	---	---
XeA:												
Xenia-----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-38	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	38-48	Clay loam, loam	CL-ML, CL	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	48-80	Loam	CL, CL-ML	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19

Table 22.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
XeB:												
Xenia-----------	0-9	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	9-29	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	29-58	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	58-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
XeB2:												
Xenia-----------	0-6	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	6-24	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	24-44	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	44-80	Loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
XfB:												
Xenia-----------	0-8	Silt loam	CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-90	20-35	2-12
	8-26	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	35-49	17-26
	26-46	Clay loam, loam	CL, CL-ML	A-6, A-7	0	0-5	90-100	85-95	70-95	50-80	25-45	4-20
	46-61	Loam, flaggy loam	CL-ML, CL	A-4, A-6	0	0-5	90-95	85-95	65-95	50-75	22-36	7-19
	61-65	Weathered bedrock			---	---	---	---	---	---	---	---

Table 23.—Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
CeA:										
Celina----------	0-10	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	10-36	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	36-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CeB:										
Celina----------	0-9	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	9-38	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	38-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CeB2:										
Celina----------	0-8	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	8-28	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	28-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CoA:										
Corwin----------	0-11	15-26	1.30-1.60	0.60-2.00	0.18-0.24	Low	.37	.37	5	6
	11-38	25-35	1.50-1.70	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	38-80	10-20	1.75-1.95	0.06-0.20	0.04-0.12	Low	.37	.43		
CtA:										
Crosby----------	0-10	10-24	1.30-1.60	0.60-2.00	0.18-0.24	Low	.43	.43	4	5
	10-25	35-45	1.45-1.65	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	25-39	12-35	1.55-1.75	0.06-0.20	0.04-0.12	Low	.28	.37		
	39-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	Low	.32	.43		
Celina----------	0-8	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	8-34	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	34-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CtB:										
Crosby----------	0-7	10-24	1.30-1.60	0.60-2.00	0.18-0.24	Low	.43	.43	4	5
	7-21	35-45	1.45-1.65	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	21-32	12-35	1.55-1.75	0.06-0.20	0.04-0.12	Low	.28	.37		
	32-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	Low	.32	.43		
Celina----------	0-10	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	10-39	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	39-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
CvA:										
Crosby----------	0-9	10-24	1.30-1.60	0.60-2.00	0.18-0.24	Low	.43	.43	4	5
	9-28	35-45	1.45-1.65	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	28-36	12-35	1.55-1.75	0.06-0.20	0.04-0.12	Low	.28	.37		
	36-80	10-25	1.75-1.95	0.01-0.20	0.02-0.04	Low	.32	.43		
Lewisburg-------	0-7	14-26	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	5
	7-19	26-48	1.40-1.70	0.20-0.60	0.11-0.17	Moderate	.37	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.37	.49		
CyA:										
Cyclone---------	0-12	18-25	1.50-1.70	0.60-2.00	0.22-0.24	Low	.28	.28	5	6
	12-50	25-35	1.50-1.70	0.60-2.00	0.18-0.20	Moderate	.28	.28		
	50-61	10-30	1.50-1.70	0.60-2.00	0.18-0.20	Moderate	.28	.28		
	61-80	10-20	1.50-1.70	0.20-0.60	0.20-0.22	Low	.28	.28		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
DaA:										
Dana------------	0-11	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.32	.32	5	5
	11-38	27-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.43	.43		
	38-55	25-35	1.45-1.65	0.60-2.00	0.15-0.19	Moderate	.43	.49		
	55-80	15-22	1.70-1.90	0.06-0.60	0.05-0.10	Low	.43	.55		
DaB:										
Dana------------	0-10	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.32	.32	5	5
	10-37	27-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.43	.43		
	37-48	25-35	1.45-1.65	0.60-2.00	0.15-0.19	Moderate	.43	.49		
	48-80	15-22	1.70-1.90	0.06-0.60	0.05-0.10	Low	.43	.55		
EeA:										
Eel-------------	0-13	18-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.32	.32	5	6
	13-37	20-32	1.40-1.60	0.60-2.00	0.17-0.22	Low	.43	.43		
	37-48	15-28	1.40-1.60	0.60-2.00	0.14-0.22	Low	.37	.43		
	48-80	15-20	1.40-1.60	6.00-20.00	0.08-0.12	Low	.37	.43		
EgA:										
Eldean----------	0-4	15-27	1.30-1.50	0.60-2.00	0.15-0.18	Low	.28	.49	4	6
	4-24	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	24-30	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	30-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EgB:										
Eldean----------	0-4	15-27	1.30-1.50	0.60-2.00	0.15-0.18	Low	.28	.49	4	6
	4-22	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	22-30	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	30-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EgB2:										
Eldean----------	0-4	15-27	1.30-1.50	0.60-2.00	0.15-0.18	Low	.28	.49	4	6
	4-20	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	20-26	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	26-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EhC3:										
Eldean----------	0-5	27-35	1.30-1.50	0.60-2.00	0.15-0.18	Low	.24	.43	3	6
	5-16	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	16-22	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	22-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EhD3:										
Eldean----------	0-5	27-35	1.30-1.50	0.60-2.00	0.15-0.18	Low	.24	.43	3	6
	5-28	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	28-35	15-35	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	35-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EkA:										
Eldean----------	0-9	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	9-28	20-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	28-36	18-38	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	36-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
EkB:										
Eldean----------	0-7	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	7-28	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	28-34	18-38	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	34-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors			Wind erodi- bility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in					
EkB2:										
Eldean----------	0-5	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	5-24	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	24-32	18-38	1.30-1.60	0.60-2.00	0.07-0.14	Low	.37	.64		
	32-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
FcA:										
Fincastle-------	0-9	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-35	23-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	35-46	12-32	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	46-80	12-26	1.75-2.00	0.06-0.20	0.05-0.19	Low	.37	.43		
FdA:										
Fincastle-------	0-9	11-27	1.40-1.55	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-36	23-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	36-43	12-32	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	43-63	12-26	1.75-2.00	0.06-0.20	0.05-0.19	Low	.37	.43		
	63-67	---	---	0.00-0.20	---	---	---	---		
FmA:										
Fox-------------	0-10	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	10-37	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Moderate	.32	.32		
	37-64	0-2	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
	64-80	18-27	1.55-1.65	0.06-0.20	0.10-0.19	Moderate	.32	.32		
FmB:										
Fox-------------	0-10	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	10-37	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Moderate	.32	.32		
	37-65	0-2	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
	65-80	18-27	1.55-1.65	0.06-0.20	0.10-0.19	Moderate	.32	.32		
FmB2:										
Fox-------------	0-8	10-17	1.35-1.55	0.60-2.00	0.17-0.24	Low	.37	.37	4	5
	8-38	18-35	1.55-1.65	0.60-2.00	0.10-0.19	Moderate	.32	.32		
	38-72	0-2	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
	72-80	18-27	1.55-1.65	0.06-0.20	0.10-0.19	Moderate	.32	.32		
HeF2:										
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-16	25-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	16-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
Miamian---------	0-4	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	4-19	27-35	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	19-29	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	29-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
HwE2:										
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-16	20-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	16-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
Wynn------------	0-5	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	5-30	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	30-33	---	---	0.00-0.20	---	---	---	---		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
HwF2:										
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-13	20-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	13-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
Wynn------------	0-4	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	4-24	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	24-27	---	---	0.00-0.20	---	---	---	---		
KeC2:										
Kendallville----	0-5	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	5-30	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	30-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
Eldean----------	0-5	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	5-26	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	26-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
KeD2:										
Kendallville----	0-3	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	3-32	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	32-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
Eldean----------	0-4	15-25	1.30-1.50	0.60-2.00	0.18-0.22	Low	.37	.43	4	5
	4-33	35-48	1.40-1.60	0.20-2.00	0.08-0.14	Moderate	.37	.49		
	33-80	2-8	1.55-1.70	6.00-20.00	0.01-0.04	Low	.10	.43		
KnA:										
Kokomo----------	0-10	20-27	1.30-1.45	0.20-0.60	0.20-0.24	Moderate	.28	.28	5	6
	10-50	30-45	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	50-68	25-45	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	68-80	15-27	1.50-1.75	0.06-0.20	0.05-0.19	Low	.32	.37		
KoA:										
Kokomo----------	0-11	27-35	1.35-1.50	0.20-0.60	0.17-0.19	Moderate	.24	.24	5	6
	11-41	30-40	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	41-64	25-45	1.40-1.60	0.20-0.60	0.18-0.20	Moderate	.32	.32		
	64-80	15-27	1.50-1.75	0.06-0.20	0.05-0.19	Low	.32	.37		
LeB:										
Lewisburg-------	0-9	16-27	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	6
	9-19	26-48	1.40-1.70	0.20-2.00	0.11-0.17	Moderate	.32	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.32	.49		
Celina----------	0-9	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	9-34	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	34-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
LfB2:										
Lewisburg-------	0-6	27-35	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	3	6
	6-19	27-48	1.40-1.70	0.20-2.00	0.11-0.17	Moderate	.32	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.32	.49		
Celina----------	0-8	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	4	6
	8-30	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	30-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
LgC3:										
Lewisburg-------	0-4	27-35	1.30-1.50	0.60-2.00	0.18-0.24	Low	.43	.43	2	6
	4-19	27-48	1.40-1.70	0.20-2.00	0.11-0.17	Moderate	.32	.37		
	19-80	18-27	1.70-2.00	0.06-0.20	0.08-0.12	Low	.32	.49		
LpA:										
Lippincott------	0-11	27-36	1.35-1.50	0.60-2.00	0.17-0.23	Moderate	.28	.32	4	6
	11-25	35-50	1.45-1.60	0.60-2.00	0.13-0.17	Moderate	.28	.32		
	25-36	5-35	1.50-1.75	6.00-20.00	0.04-0.10	Low	.10	.37		
	36-80	2-10	1.50-1.75	6.00-20.00	0.02-0.04	Low	.10	.37		
MaA:										
Medway----------	0-12	18-27	1.20-1.45	0.60-2.00	0.20-0.24	Low	.28	.28	5	6
	12-38	18-32	1.20-1.50	0.60-2.00	0.14-0.18	Low	.32	.37		
	38-80	5-30	1.20-1.60	0.60-6.00	0.08-0.15	Low	.32	.49		
MbB2:										
Miami-----------	0-5	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	5
	5-23	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	23-30	15-30	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	30-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
McE2:										
Miami-----------	0-5	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	5
	5-22	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	22-31	15-25	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	31-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
Kendallville----	0-5	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	5-31	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	31-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
McF2:										
Miami-----------	0-4	7-26	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	5
	4-10	24-35	1.40-1.60	0.60-2.00	0.16-0.20	Moderate	.49	.49		
	10-22	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	22-28	12-32	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	28-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
Kendallville----	0-4	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	4-40	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	40-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
MdC2:										
Miami-----------	0-5	20-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	5-20	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	20-26	15-30	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	26-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		
MdD2:										
Miami-----------	0-5	20-27	1.30-1.60	0.60-2.00	0.20-0.24	Low	.37	.37	5	6
	5-24	27-35	1.40-1.70	0.60-2.00	0.07-0.21	Moderate	.32	.32		
	24-30	15-30	1.60-1.80	0.20-0.60	0.07-0.17	Low	.37	.43		
	30-80	10-20	1.75-2.00	0.01-0.20	0.01-0.03	Low	.37	.43		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
MeC:										
Miamian---------	0-9	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	9-12	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	12-24	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	24-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
MeC2:										
Miamian---------	0-6	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	6-18	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	18-29	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	29-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
MeD2:										
Miamian---------	0-6	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	6-22	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	22-27	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	27-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
MfB:										
Miamian---------	0-9	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	9-29	27-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	29-35	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	35-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Celina----------	0-10	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	10-34	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	34-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
MfB2:										
Miamian---------	0-9	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	9-24	27-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	24-36	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	36-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Celina----------	0-9	14-26	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	5
	9-33	25-38	1.45-1.60	0.20-0.60	0.16-0.19	Moderate	.37	.37		
	33-80	20-30	1.60-1.82	0.01-0.06	0.06-0.10	Low	.37	.49		
MgE2:										
Miamian---------	0-4	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	4-28	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	28-38	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	38-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Kendallville----	0-4	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	4-29	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	29-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
MgF2:										
Miamian---------	0-6	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	6-23	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	23-28	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	28-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Kendallville----	0-4	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	4-35	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	35-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
MhC3:										
Miamian---------	0-4	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	3	6
	4-19	27-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	19-26	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	26-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Losantville-----	0-3	27-35	1.30-1.55	0.20-0.60	0.18-0.24	Low	.32	.32	2	6
	3-19	25-40	1.50-1.70	0.20-0.60	0.07-0.14	Moderate	.28	.32		
	19-80	18-24	1.70-2.00	0.01-0.20	0.02-0.04	Low	.37	.49		
MhD3:										
Miamian---------	0-3	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	3	6
	3-26	27-42	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	26-33	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	33-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Losantville-----	0-3	27-35	1.30-1.55	0.20-0.60	0.18-0.24	Low	.32	.32	2	6
	3-14	25-40	1.50-1.70	0.20-0.60	0.07-0.14	Moderate	.28	.32		
	14-80	18-24	1.70-2.00	0.01-0.20	0.02-0.04	Low	.37	.49		
MmE2:										
Miamian---------	0-3	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	3-18	35-48	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	18-26	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	26-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Hennepin--------	0-4	20-27	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	5	4L
	4-19	25-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	19-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
MnE3:										
Miamian---------	0-3	27-35	1.30-1.50	0.20-0.60	0.20-0.24	Low	.32	.32	3	6
	3-18	27-42	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	18-26	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	26-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
Hennepin--------	0-4	27-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.28	.28	4	4L
	4-18	25-35	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.32	.37		
	18-80	10-27	1.80-1.95	0.06-0.20	0.06-0.20	Low	.32	.32		
MpA:										
Milford---------	0-10	30-39	1.35-1.45	0.20-0.60	0.21-0.23	Moderate	.28	.28	5	4
	10-34	35-45	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	34-46	25-42	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	46-80	20-30	1.50-1.60	0.20-0.60	0.18-0.22	Low	.28	.32		
MrA:										
Milford---------	0-11	30-39	1.35-1.45	0.20-0.60	0.21-0.23	Moderate	.28	.28	5	4
	11-24	35-45	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	24-46	25-42	1.40-1.60	0.20-0.60	0.15-0.20	High	.32	.32		
	46-73	1-29	1.50-1.60	0.60-2.00	0.18-0.22	Low	.28	.32		
	73-80	0-6	1.30-1.70	6.00-60.00	0.02-0.07	Low	.10	.10		
MsA:										
Millsdale-------	0-16	20-27	1.30-1.50	0.20-0.60	0.17-0.22	Moderate	.28	.32	2	6
	16-25	35-45	1.40-1.65	0.20-0.60	0.12-0.16	High	.32	.37		
	25-32	---	---	0.00-0.20	---	---	---	---		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
MtA:										
Millsdale-------	0-14	27-32	1.30-1.50	0.20-0.60	0.17-0.22	Moderate	.28	.32	2	6
	14-30	35-45	1.40-1.65	0.20-0.60	0.12-0.16	High	.32	.37		
	30-38	---	---	0.00-0.20	---	---	---	---		
MuA:										
Milton----------	0-9	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	9-31	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	31-60	---	---	0.00-0.20	---	---	---	---		
MuB:										
Milton----------	0-9	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	9-28	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	28-60	---	---	0.00-0.20	---	---	---	---		
MuB2:										
Milton----------	0-5	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	5-24	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	24-28	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	28-35	---	---	0.00-0.20	---	---	---	---		
MuC2:										
Milton----------	0-3	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	3-25	25-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	25-28	18-38	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	28-35	---	---	0.00-0.20	---	---	---	---		
MuD2:										
Milton----------	0-5	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	5-25	32-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	25-29	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	29-36	---	---	0.00-0.20	---	---	---	---		
MuE2:										
Milton----------	0-4	14-27	1.30-1.50	0.60-2.00	0.18-0.23	Low	.37	.37	2	6
	4-16	32-45	1.45-1.65	0.20-2.00	0.12-0.18	Moderate	.37	.43		
	16-23	25-45	1.40-1.70	0.20-2.00	0.12-0.16	Moderate	.37	.43		
	23-35	---	---	0.00-0.20	---	---	---	---		
MwA:										
Morningsun------	0-10	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	10-33	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	33-42	10-30	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	42-51	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	51-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
MxA:										
Morningsun------	0-11	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	11-38	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	38-45	10-30	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	45-58	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	58-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
Xenia-----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-30	20-40	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	30-45	24-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	45-80	12-27	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors			Wind erodi- bility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in					
MxB:										
Morningsun------	0-10	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	10-34	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	34-48	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	48-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
Xenia-----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-30	25-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	30-50	24-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	50-80	12-27	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
MxB2:										
Morningsun------	0-6	15-27	1.30-1.50	0.60-2.00	0.22-0.25	Low	.37	.37	5	6
	6-26	20-35	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	26-31	10-30	1.35-1.55	0.60-2.00	0.21-0.24	Low	.37	.37		
	31-50	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	50-80	5-10	1.70-1.95	0.60-2.00	0.05-0.19	Low	.37	.43		
Xenia-----------	0-5	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	5-28	27-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	28-45	24-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	45-80	12-27	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
MyA:										
Mahalasville----	0-12	20-27	1.20-1.65	0.60-2.00	0.20-0.26	Moderate	.28	.28	5	6
	12-39	25-38	1.40-1.70	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	39-44	18-27	1.50-1.70	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	44-80	2-10	1.60-1.80	2.00-6.00	0.03-0.05	Low	.15	.15		
OcA:										
Ockley----------	0-9	11-27	1.30-1.40	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	9-48	20-37	1.40-1.55	0.60-2.00	0.06-0.11	Moderate	.24	.43		
	48-80	2-6	1.60-1.80	20.00-99.90	0.02-0.04	Low	.10	.37		
OcB:										
Ockley----------	0-9	11-27	1.30-1.40	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	9-50	20-35	1.40-1.55	0.60-2.00	0.06-0.11	Moderate	.24	.43		
	50-80	2-6	1.60-1.80	20.00-99.90	0.02-0.04	Low	.10	.37		
Pg, Pq.										
Pits										
PtB:										
Plattville------	0-18	15-26	1.30-1.60	0.60-2.00	0.18-0.24	Low	.32	.32	3	6
	18-43	25-35	1.50-1.70	0.60-2.00	0.11-0.16	Moderate	.28	.32		
	43-54	15-55	1.70-1.90	0.60-2.00	0.04-0.12	Low	.37	.43		
	54-57	---	---	0.00-0.20	---	---	---	---		
RaA:										
Rainsville------	0-8	13-25	1.30-1.60	0.60-2.00	0.20-0.24	Low	.43	.43	5	5
	8-15	24-30	1.40-1.60	0.60-2.00	0.16-0.20	Moderate	.49	.49		
	15-35	20-30	1.40-1.60	0.60-2.00	0.17-0.19	Moderate	.43	.43		
	35-55	20-30	1.40-1.60	0.20-0.60	0.14-0.18	Moderate	.32	.37		
	55-80	15-22	1.75-2.00	0.01-0.20	0.02-0.04	Low	.32	.37		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors			Wind erodi- bility group
							Kw	Kf	T	
	In	Pct	g/cc	In/hr	In/in					
RaB:										
Rainsville------	0-10	13-25	1.30-1.60	0.60-2.00	0.20-0.24	Low	.43	.43	5	5
	10-16	24-30	1.40-1.60	0.60-2.00	0.16-0.20	Moderate	.49	.49		
	16-44	20-30	1.40-1.60	0.60-2.00	0.17-0.19	Moderate	.43	.43		
	44-50	20-30	1.40-1.60	0.20-0.60	0.14-0.18	Moderate	.32	.37		
	50-80	15-22	1.75-2.00	0.01-0.20	0.02-0.04	Low	.32	.37		
RaB2:										
Rainsville------	0-6	13-25	1.30-1.60	0.60-2.00	0.20-0.24	Low	.43	.43	5	5
	6-36	20-30	1.40-1.60	0.60-2.00	0.17-0.19	Moderate	.43	.43		
	36-52	20-30	1.40-1.60	0.20-0.60	0.14-0.18	Moderate	.32	.37		
	52-80	15-22	1.75-2.00	0.01-0.20	0.02-0.04	Low	.32	.37		
RcA:										
Randolph--------	0-10	16-27	1.30-1.45	0.20-0.60	0.17-0.22	Low	.37	.37	2	6
	10-27	35-50	1.40-1.65	0.20-0.60	0.13-0.16	Moderate	.37	.43		
	27-33	27-42	1.50-1.70	0.20-0.60	0.04-0.11	Low	.37	.64		
	33-35	---	---	0.00-0.20	---	---	---	---		
RcB:										
Randolph--------	0-8	16-27	1.30-1.45	0.20-0.60	0.17-0.22	Low	.37	.37	2	6
	8-23	35-50	1.40-1.65	0.20-0.60	0.13-0.16	Moderate	.37	.43		
	23-32	27-36	1.50-1.70	0.20-0.60	0.04-0.11	Low	.37	.64		
	32-35	---	---	0.00-0.20	---	---	---	---		
RnE2:										
Rodman----------	0-8	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	8-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
RnF2:										
Rodman----------	0-4	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	4-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
RoE2:										
Rodman----------	0-8	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	8-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
Kendallville----	0-12	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	12-49	27-37	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	49-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
RoF2:										
Rodman----------	0-4	8-25	1.20-1.50	2.00-6.00	0.10-0.12	Low	.20	.32	3	5
	4-12	5-25	1.10-1.50	2.00-6.00	0.09-0.12	Low	.20	.32		
	12-80	0-10	1.60-1.70	20.00-99.90	0.02-0.04	Low	.10	.37		
Kendallville----	0-7	8-24	1.30-1.50	0.60-2.00	0.18-0.24	Low	.37	.43	5	5
	7-40	27-38	1.40-1.65	0.60-2.00	0.12-0.16	Moderate	.37	.55		
	40-80	15-27	1.75-2.00	0.20-0.60	0.11-0.15	Low	.37	.43		
RpA:										
Rossburg--------	0-18	13-27	1.20-1.50	0.60-2.00	0.19-0.24	Low	.37	.37	5	5
	18-35	18-27	1.25-1.60	0.60-2.00	0.15-0.22	Low	.37	.37		
	35-52	5-15	1.30-1.60	2.00-20.00	0.05-0.15	Low	.24	.32		
	52-80	0-10	1.20-1.50	2.00-20.00	0.02-0.05	Low	.10	.17		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
RuB:										
Russell----------	0-8	11-27	1.30-1.45	0.60-2.00	0.21-0.24	Low	.37	.37	5	5
	8-35	25-35	1.40-1.60	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	35-58	23-33	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	58-80	12-27	1.60-1.80	0.20-0.60	0.05-0.19	Low	.37	.43		
Miamian----------	0-5	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	5-10	25-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	10-32	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	32-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
RuB2:										
Russell----------	0-6	11-27	1.30-1.45	0.60-2.00	0.21-0.24	Low	.37	.37	5	5
	6-32	25-35	1.40-1.60	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	32-50	23-33	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	50-80	12-27	1.60-1.80	0.20-0.60	0.05-0.19	Low	.37	.43		
Miamian----------	0-4	14-27	1.30-1.50	0.20-0.60	0.20-0.24	Low	.37	.37	4	6
	4-26	25-45	1.40-1.60	0.20-0.60	0.16-0.20	Moderate	.37	.43		
	26-33	25-40	1.45-1.70	0.20-0.60	0.12-0.17	Moderate	.37	.43		
	33-80	16-26	1.80-2.00	0.06-0.20	0.06-0.10	Low	.37	.49		
SeA:										
Savona-----------	0-7	10-25	1.25-1.45	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	7-29	25-42	1.30-1.50	0.20-2.00	0.08-0.17	Moderate	.37	.43		
	29-45	15-35	1.25-1.45	0.20-2.00	0.12-0.17	Low	.24	.49		
	45-80	2-10	1.20-1.50	6.00-20.00	0.02-0.05	Low	.10	.43		
SnA:										
Sloan------------	0-10	15-27	1.20-1.40	0.60-2.00	0.19-0.24	Low	.28	.28	5	6
	10-45	20-40	1.25-1.55	0.20-2.00	0.15-0.19	Moderate	.37	.37		
	45-60	8-27	1.20-1.50	2.00-20.00	0.13-0.18	Low	.37	.43		
	60-80	0-10	1.20-1.50	2.00-20.00	0.02-0.05	Low	.10	.17		
StA:										
Stonelick--------	0-10	10-20	1.35-1.45	2.00-6.00	0.20-0.22	Low	.32	.37	5	4L
	10-30	6-27	1.35-1.70	2.00-6.00	0.19-0.21	Low	.24	.28		
	30-80	4-10	1.70-1.80	6.00-20.00	0.02-0.04	Low	.10	.37		
SvA:										
Sugarvalley------	0-10	12-27	1.20-1.45	0.60-2.00	0.17-0.24	Low	.37	.37	5	5
	10-41	25-35	1.30-1.55	0.60-2.00	0.17-0.22	Moderate	.37	.37		
	41-51	10-30	1.35-1.55	0.60-2.00	0.15-0.20	Low	.37	.37		
	51-61	10-30	1.35-1.55	0.60-2.00	0.14-0.24	Moderate	.37	.37		
	61-80	5-28	1.70-1.95	0.60-2.00	0.15-0.18	Low	.37	.43		
SwA:										
Sugarvalley------	0-9	12-27	1.20-1.45	0.60-2.00	0.17-0.24	Low	.37	.37	5	5
	9-30	25-35	1.30-1.55	0.60-2.00	0.17-0.22	Moderate	.37	.37		
	30-50	10-30	1.35-1.55	0.60-2.00	0.15-0.20	Low	.37	.37		
	50-80	5-28	1.70-1.95	0.60-2.00	0.15-0.18	Low	.37	.43		
Fincastle--------	0-11	11-22	1.40-1.55	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	11-32	23-35	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	32-48	24-32	1.45-1.65	0.60-2.00	0.15-0.19	Moderate	.37	.37		
	48-80	20-26	1.55-1.90	0.06-0.20	0.05-0.19	Low	.37	.43		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Erosion factors Kw	Kf	T	Wind erodi- bility group
	In	Pct	g/cc	In/hr	In/in					
ThA:										
Thackery--------	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	12-21	20-35	1.30-1.55	0.60-2.00	0.17-0.22	Low	.37	.37		
	21-54	25-30	1.35-1.60	0.60-2.00	0.13-0.18	Moderate	.37	.43		
	54-80	2-12	1.60-1.80	6.00-20.00	0.02-0.06	Low	.10	.49		
ThB:										
Thackery--------	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	Low	.37	.37	4	5
	12-67	25-30	1.35-1.60	0.60-2.00	0.13-0.18	Moderate	.37	.43		
	67-80	2-12	1.60-1.80	6.00-20.00	0.02-0.06	Low	.10	.49		
Ud.										
Udorthents										
W.										
Water										
WbA:										
Warsaw----------	0-12	15-25	1.30-1.50	0.60-2.00	0.20-0.24	Low	.28	.28	4	5
	12-21	17-30	1.35-1.60	0.60-2.00	0.16-0.19	Low	.28	.32		
	21-30	20-30	1.40-1.65	0.60-2.00	0.13-0.16	Low	.28	.43		
	30-80	2-8	1.40-1.65	20.00-99.90	0.02-0.04	Low	.10	.37		
WnA:										
Westland--------	0-12	23-27	1.40-1.60	0.60-2.00	0.20-0.23	Moderate	.24	.28	4	6
	12-20	20-40	1.40-1.65	0.60-2.00	0.13-0.19	Moderate	.28	.32		
	20-51	5-35	1.55-1.70	0.60-2.00	0.07-0.17	Low	.24	.37		
	51-80	1-10	1.70-2.10	20.00-99.90	0.01-0.04	Low	.05	.10		
WyB:										
Wynn------------	0-8	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	8-14	30-40	1.35-1.55	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	14-31	30-45	1.45-1.75	0.06-0.60	0.09-0.18	High	.37	.37		
	31-35	---	---	0.00-0.20	---	---	---	---		
WyB2:										
Wynn------------	0-8	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	8-23	30-40	1.35-1.55	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	23-28	35-45	1.45-1.75	0.06-0.60	0.09-0.18	High	.37	.37		
	28-38	---	---	0.00-0.20	---	---	---	---		
WyC2:										
Wynn------------	0-5	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	5-23	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	23-38	---	---	0.00-0.20	---	---	---	---		
WyD2:										
Wynn------------	0-5	17-27	1.30-1.50	0.20-0.60	0.22-0.24	Low	.37	.37	4	6
	5-28	30-45	1.45-1.75	0.20-0.60	0.15-0.20	Moderate	.37	.37		
	28-38	---	---	0.00-0.20	---	---	---	---		
XeA:										
Xenia-----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-38	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	38-48	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	48-80	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		

Table 23.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Shrink-swell potential	Erosion factors Kw	Kf	T	Wind erodi-bility group
	In	Pct	g/cc	In/hr	In/in					
XeB:										
Xenia-----------	0-9	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	9-29	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	29-58	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	58-80	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
XeB2:										
Xenia-----------	0-6	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	5	5
	6-24	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	24-44	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	44-80	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
XfB:										
Xenia-----------	0-8	11-27	1.30-1.50	0.60-2.00	0.22-0.24	Low	.37	.37	4	5
	8-26	25-37	1.45-1.65	0.60-2.00	0.18-0.20	Moderate	.37	.37		
	26-46	20-35	1.45-1.65	0.20-0.60	0.15-0.19	Moderate	.37	.43		
	46-61	12-20	1.70-1.90	0.06-0.20	0.05-0.10	Low	.37	.43		
	61-65	---	---	0.00-0.20	---	---	---	---		

Table 24.—Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
CeA:					
Celina----------	0-10	5.6-7.3	1.0-3.0	9.0-19	0
	10-36	4.5-7.8	0.0-0.5	18-32	0-15
	36-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CeB:					
Celina----------	0-9	5.6-7.3	1.0-3.0	9.0-19	0
	9-38	4.5-7.8	0.0-0.5	18-32	0-15
	38-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CeB2:					
Celina----------	0-8	5.6-7.3	0.8-2.2	8.0-16	0
	8-28	4.5-7.8	0.0-0.5	18-32	0-15
	28-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CoA:					
Corwin----------	0-11	5.1-7.3	2.0-4.0	10-24	0
	11-38	5.1-7.8	0.5-1.0	11-23	0-30
	38-80	7.4-8.4	0.0-0.0	4.0-17	20-30
CtA:					
Crosby----------	0-10	5.1-7.3	1.0-3.0	6.0-20	0
	10-25	5.1-7.3	0.5-1.0	15-29	0
	25-39	7.4-8.4	0.0-0.5	5.0-17	5-40
	39-80	7.4-8.4	0.0-0.0	4.0-16	20-50
Celina----------	0-8	5.6-7.3	1.0-3.0	9.0-19	0
	8-34	4.5-7.8	0.0-0.5	18-32	0-15
	34-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CtB:					
Crosby----------	0-7	5.1-7.3	1.0-3.0	6.0-20	0
	7-21	5.1-7.3	0.5-1.0	15-29	0
	21-32	7.4-8.4	0.0-0.5	5.0-17	5-40
	32-80	7.4-8.4	0.0-0.0	4.0-16	20-50
Celina----------	0-10	5.6-7.3	1.0-3.0	9.0-19	0
	10-39	4.5-7.8	0.0-0.5	18-32	0-15
	39-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CvA:					
Crosby----------	0-9	5.1-7.3	1.0-3.0	6.0-20	0
	9-28	5.1-7.3	0.5-1.0	15-29	0
	28-36	7.4-8.4	0.0-0.5	5.0-17	5-40
	36-80	7.4-8.4	0.0-0.0	4.0-16	20-50
Lewisburg-------	0-7	5.6-7.3	1.0-3.0	9.0-19	0
	7-19	5.6-7.8	0.0-0.5	18-32	0-15
	19-80	7.4-8.4	0.0-0.0	8.0-14	25-45
CyA:					
Cyclone---------	0-12	5.6-7.3	4.0-6.0	15-27	0
	12-50	6.1-7.3	1.0-2.0	10-22	0
	50-61	6.6-8.4	1.0-2.0	6.0-18	5-30
	61-80	7.4-8.4	0.0-1.0	4.0-14	15-40

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
DaA:					
Dana------------	0-11	5.6-7.3	3.0-5.0	10-25	0
	11-38	5.1-7.3	0.5-1.0	10-25	0
	38-55	6.6-8.4	0.2-0.5	10-20	0-25
	55-80	7.4-8.4	0.2-0.5	5.0-15	15-25
DaB:					
Dana------------	0-10	5.6-7.3	3.0-5.0	10-25	0
	10-37	5.1-7.3	0.5-1.0	10-25	0
	37-48	6.6-8.4	0.2-0.5	10-20	0-25
	48-80	7.4-8.4	0.2-0.5	5.0-15	15-25
EeA:					
Eel-------------	0-13	6.1-7.3	2.0-3.0	12-20	0
	13-37	6.1-7.8	1.0-2.0	12-20	0
	37-48	6.6-7.8	1.0-2.0	8.0-18	0-35
	48-80	7.4-8.4	0.3-0.5	8.0-18	5-35
EgA:					
Eldean----------	0-4	5.6-7.3	1.0-3.0	8.0-22	0
	4-24	5.6-7.3	0.3-1.0	20-30	0
	24-30	6.6-7.8	0.1-0.5	20-30	0-50
	30-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EgB:					
Eldean----------	0-4	5.6-7.3	1.0-3.0	8.0-22	0
	4-22	5.6-7.3	0.3-1.0	20-30	0
	22-30	6.6-7.8	0.1-0.5	20-30	0-50
	30-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EgB2:					
Eldean----------	0-4	5.6-7.3	0.8-2.2	6.0-20	0
	4-20	5.6-7.3	0.3-1.0	20-30	0
	20-26	6.6-7.8	0.1-0.5	20-30	0-50
	26-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EhC3:					
Eldean----------	0-5	5.6-7.3	0.5-2.0	6.0-20	0
	5-16	5.6-7.3	0.3-1.0	20-30	0
	16-22	6.6-7.8	0.1-0.5	20-30	0-50
	22-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EhD3:					
Eldean----------	0-5	5.6-7.3	0.5-2.0	6.0-20	0
	5-28	5.6-7.3	0.3-1.0	20-30	0
	28-35	6.6-7.8	0.1-0.5	20-30	0-50
	35-80	7.4-8.4	0.1-0.3	1.0-8.0	40-65
EkA:					
Eldean----------	0-9	5.6-7.3	1.0-3.0	8.0-21	0
	9-28	5.6-7.3	0.5-1.0	20-30	0
	28-36	6.6-7.8	0.5-1.0	20-30	0-50
	36-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
EkB:					
Eldean----------	0-7	5.6-7.3	1.0-3.0	8.0-21	0
	7-28	5.6-7.3	0.5-1.0	20-30	0
	28-34	6.6-7.8	0.5-1.0	20-30	0-50
	34-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
EkB2:					
Eldean----------	0-5	5.6-7.3	0.8-2.2	6.0-20	0
	5-24	5.6-7.3	0.5-1.0	20-30	0
	24-32	6.6-7.8	0.5-1.0	20-30	0-50
	32-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
FcA:					
Fincastle-------	0-9	5.1-7.3	1.0-3.0	6.0-20	0
	9-35	4.5-6.5	0.0-0.5	9.0-23	0
	35-46	5.1-7.8	0.0-0.3	9.0-23	0-25
	46-80	7.4-8.4	0.0-0.0	8.0-16	15-35
FdA:					
Fincastle-------	0-9	5.1-7.3	1.0-3.0	6.0-20	0
	9-36	4.5-6.5	0.0-0.5	9.0-23	0
	36-43	5.1-7.8	0.0-0.3	9.0-23	0-25
	43-63	7.4-8.4	0.0-0.0	8.0-16	15-35
	63-67	---	0.0-0.0	0.0-0.0	0
FmA:					
Fox-------------	0-10	5.1-7.3	1.0-3.0	4.0-20	0
	10-37	5.6-7.8	0.0-0.5	4.0-30	0-45
	37-64	7.4-8.4	0.0-0.5	0.0-3.0	5-45
	64-80	7.4-8.4	0.0-0.5	4.0-30	5-45
FmB:					
Fox-------------	0-10	5.1-7.3	1.0-3.0	4.0-20	0
	10-37	5.6-7.8	0.0-0.5	4.0-30	0-45
	37-65	7.4-8.4	0.0-0.5	0.0-3.0	5-45
	65-80	7.4-8.4	0.0-0.5	4.0-30	5-45
FmB2:					
Fox-------------	0-8	5.1-7.3	0.8-2.2	2.0-18	0
	8-38	5.6-7.8	0.0-0.5	4.0-30	0-45
	38-72	7.4-8.4	0.0-0.5	0.0-3.0	5-45
	72-80	7.4-8.4	0.0-0.5	4.0-30	5-45
HeF2:					
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-16	6.1-8.4	0.1-0.5	12-22	0-35
	16-80	7.4-8.4	0.0-0.1	7.0-16	25-45
Miamian---------	0-4	5.6-7.3	0.8-2.2	10-18	0
	4-19	4.5-7.3	0.5-1.0	12-22	0
	19-29	5.1-8.4	0.3-1.0	17-28	0-15
	29-80	7.4-8.4	0.1-0.5	7.0-16	25-50
HwE2:					
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-16	6.1-8.4	0.1-0.5	12-22	0-35
	16-80	7.4-8.4	0.0-0.1	7.0-16	25-45
Wynn------------	0-5	5.1-7.3	0.8-2.2	9.0-22	0
	5-30	6.1-8.4	0.0-0.5	18-24	0-10
	30-33	---	0.0-0.0	0.0-0.0	0

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
HwF2:					
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-13	6.1-8.4	0.1-0.5	12-22	0-35
	13-80	7.4-8.4	0.0-0.1	7.0-16	25-45
Wynn------------	0-4	5.1-7.3	0.8-2.2	9.0-22	0
	4-24	6.1-8.4	0.0-0.5	18-24	0-10
	24-27	---	0.0-0.0	0.0-0.0	0
KeC2:					
Kendallville----	0-5	5.6-7.3	0.8-2.2	4.0-18	0
	5-30	5.6-7.8	0.1-0.5	10-28	0
	30-80	7.4-8.4	0.1-0.3	7.0-18	20-45
Eldean----------	0-5	5.6-7.3	0.8-2.2	8.0-21	0
	5-26	5.6-7.8	0.5-1.0	20-30	0-50
	26-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
KeD2:					
Kendallville----	0-3	5.6-7.3	0.8-2.2	4.0-18	0
	3-32	5.6-7.8	0.1-0.5	10-28	0
	32-80	7.4-8.4	0.1-0.3	7.0-18	20-45
Eldean----------	0-4	5.6-7.3	0.8-2.2	8.0-21	0
	4-33	5.6-7.8	0.5-1.0	20-30	0-50
	33-80	7.4-8.4	0.5-1.0	1.0-8.0	40-65
KnA:					
Kokomo----------	0-10	5.1-7.3	3.0-6.0	14-29	0
	10-50	5.6-7.3	1.0-2.0	16-28	0
	50-68	5.6-7.8	1.0-2.0	16-28	0-20
	68-80	7.4-8.4	0.0-0.2	6.0-17	15-35
KoA:					
Kokomo----------	0-11	5.1-7.3	3.0-6.0	16-33	0
	11-41	5.6-7.3	1.0-2.0	16-28	0
	41-64	5.6-7.8	1.0-2.0	16-28	0-20
	64-80	7.4-8.4	0.0-0.2	6.0-17	15-35
LeB:					
Lewisburg-------	0-9	5.6-7.3	1.0-3.0	8.0-19	0
	9-19	5.6-7.8	0.0-0.5	14-28	0-15
	19-80	7.4-8.4	0.0-0.0	8.0-16	25-45
Celina----------	0-9	5.6-7.3	1.0-3.0	9.0-19	0
	9-34	4.5-7.8	0.5-1.0	18-32	0-15
	34-80	7.4-8.4	0.3-0.5	8.0-14	25-45
LfB2:					
Lewisburg-------	0-6	5.6-7.3	0.8-2.2	7.0-18	0
	6-19	5.6-7.8	0.0-0.5	14-28	0-15
	19-80	7.4-8.4	0.0-0.0	8.0-16	25-45
Celina----------	0-8	5.6-7.3	0.8-2.2	8.0-18	0
	8-30	4.5-7.8	0.5-1.0	18-32	0-15
	30-80	7.4-8.4	0.3-0.5	8.0-14	25-45

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
LgC3:					
Lewisburg-------	0-4	5.6-7.3	0.5-2.0	7.0-18	0
	4-19	5.6-7.8	0.0-0.5	14-28	0-5
	19-80	7.4-8.4	0.0-0.0	8.0-16	25-45
LpA:					
Lippincott------	0-11	6.1-7.3	4.0-8.0	20-40	0
	11-25	6.6-7.8	2.0-4.0	14-30	0-5
	25-36	7.4-8.4	0.5-2.0	2.0-10	30-55
	36-80	7.4-8.4	0.0-0.0	1.0-6.0	40-65
MaA:					
Medway----------	0-12	6.1-7.8	3.0-6.0	13-28	0
	12-38	6.1-8.4	0.5-1.0	7.0-17	0
	38-80	6.1-8.4	0.3-0.5	2.0-18	0-20
MbB2:					
Miami-----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-23	5.1-7.3	0.0-0.5	9.0-20	0
	23-30	6.6-8.4	0.0-0.5	4.0-11	0-20
	30-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
McE2:					
Miami-----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-22	5.1-7.3	0.0-0.5	9.0-20	0
	22-31	6.6-8.4	0.0-0.5	4.0-11	0-20
	31-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
Kendallville----	0-5	5.6-7.3	1.0-3.0	4.0-18	0
	5-31	5.6-7.8	0.1-0.5	10-28	0
	31-80	7.4-8.4	0.1-0.3	7.0-18	20-45
McF2:					
Miami-----------	0-4	5.6-7.3	1.0-2.0	6.0-17	0
	4-10	5.1-7.3	0.5-1.0	9.0-25	0
	10-22	5.1-7.3	0.0-0.5	9.0-20	0
	22-28	6.6-8.4	0.0-0.5	4.0-11	0-20
	28-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
Kendallville----	0-4	5.6-7.3	1.0-3.0	4.0-18	0
	4-40	5.6-7.8	0.1-0.5	10-28	0
	40-80	7.4-8.4	0.1-0.3	7.0-18	20-45
MdC2:					
Miami-----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-20	5.1-7.3	0.0-0.5	9.0-20	0
	20-26	6.6-8.4	0.0-0.5	4.0-11	0-20
	26-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
MdD2:					
Miami-----------	0-5	5.6-7.3	1.0-2.0	6.0-17	0
	5-24	5.1-7.3	0.0-0.5	9.0-20	0
	24-30	6.6-8.4	0.0-0.5	4.0-11	0-20
	30-80	7.4-8.4	0.0-0.5	2.0-9.0	20-45
MeC:					
Miamian---------	0-9	5.6-7.3	1.0-3.0	10-18	0
	9-12	4.5-7.3	0.5-1.0	12-22	0
	12-24	5.1-8.4	0.3-1.0	17-28	0-15
	24-80	7.4-8.4	0.1-0.5	7.0-16	25-50

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
MeC2:					
Miamian---------	0-6	5.6-7.3	0.8-2.2	9.0-17	0
	6-18	4.5-7.3	0.5-1.0	12-22	0
	18-29	5.1-8.4	0.3-1.0	17-28	0-15
	29-80	7.4-8.4	0.1-0.5	7.0-16	25-50
MeD2:					
Miamian---------	0-6	5.6-7.3	0.8-2.2	9.0-17	0
	6-22	4.5-7.3	0.5-1.0	12-22	0
	22-27	5.1-8.4	0.3-1.0	17-28	0-15
	27-80	7.4-8.4	0.1-0.5	7.0-16	25-50
MfB:					
Miamian---------	0-9	5.6-7.3	1.0-3.0	10-18	0
	9-29	4.5-7.3	0.5-1.0	12-22	0
	29-35	5.1-8.4	0.3-1.0	17-28	0-15
	35-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Celina----------	0-10	5.6-7.3	1.0-3.0	9.0-19	0
	10-34	4.5-7.8	0.5-1.0	18-32	0-15
	34-80	7.4-8.4	0.3-0.5	8.0-14	25-45
MfB2:					
Miamian---------	0-9	5.6-7.3	0.8-2.2	9.0-17	0
	9-24	4.5-7.3	0.5-1.0	12-22	0
	24-36	5.1-8.4	0.3-1.0	17-28	0-15
	36-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Celina----------	0-9	5.6-7.3	0.8-2.2	8.0-18	0
	9-33	4.5-7.8	0.5-1.0	18-32	0-15
	33-80	7.4-8.4	0.3-0.5	8.0-14	25-45
MgE2:					
Miamian---------	0-4	5.6-7.3	0.8-2.2	9.0-17	0
	4-28	4.5-7.3	0.5-1.0	12-22	0
	28-38	5.1-8.4	0.3-1.0	17-28	0-15
	38-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Kendallville----	0-4	5.6-7.3	0.8-2.2	4.0-18	0
	4-29	5.6-7.8	0.1-0.5	10-28	0
	29-80	7.4-8.4	0.1-0.3	7.0-18	20-45
MgF2:					
Miamian---------	0-6	5.6-7.3	0.8-2.2	9.0-17	0
	6-23	4.5-7.3	0.5-1.0	12-22	0
	23-28	5.1-8.4	0.3-1.0	17-28	0-15
	28-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Kendallville----	0-4	5.6-7.3	0.8-2.2	4.0-18	0
	4-35	5.6-7.8	0.1-0.5	10-28	0
	35-80	7.4-8.4	0.1-0.3	7.0-18	20-45
MhC3:					
Miamian---------	0-4	5.6-7.3	0.5-2.0	8.0-16	0
	4-19	4.5-7.3	0.5-1.0	12-22	0
	19-26	5.1-8.4	0.3-1.0	17-28	0-15
	26-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Losantville-----	0-3	5.6-7.3	0.5-2.0	9.0-21	0
	3-19	6.1-8.4	0.0-0.5	14-28	0-5
	19-80	7.4-8.4	0.0-0.5	7.0-16	25-45

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
MhD3:					
Miamian---------	0-3	5.6-7.3	0.5-2.0	8.0-16	0
	3-26	4.5-7.3	0.5-1.0	12-22	0
	26-33	5.1-8.4	0.3-1.0	17-28	0-15
	33-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Losantville-----	0-3	5.6-7.3	0.5-2.0	9.0-21	0
	3-14	6.1-8.4	0.0-0.5	14-28	0-5
	14-80	7.4-8.4	0.0-0.5	7.0-16	25-45
MmE2:					
Miamian---------	0-3	5.6-7.3	0.8-2.2	9.0-17	0
	3-18	4.5-7.3	0.5-1.0	12-22	0
	18-26	5.1-8.4	0.3-1.0	17-28	0-15
	26-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-19	6.1-8.4	0.1-0.5	12-22	0-35
	19-80	7.4-8.4	0.0-0.1	7.0-16	25-45
MnE3:					
Miamian---------	0-3	5.6-7.3	0.5-2.0	9.0-17	0
	3-18	4.5-7.3	0.5-1.0	12-22	0
	18-26	5.1-8.4	0.3-1.0	17-28	0-15
	26-80	7.4-8.4	0.1-0.5	7.0-16	25-50
Hennepin--------	0-4	6.1-8.4	0.5-2.0	14-20	0-10
	4-18	6.1-8.4	0.1-0.5	12-22	0-35
	18-80	7.4-8.4	0.0-0.1	7.0-16	25-45
MpA:					
Milford---------	0-10	6.1-7.3	4.0-6.0	26-36	0
	10-34	5.6-7.3	0.5-2.0	22-29	0
	34-46	6.1-7.8	0.5-2.0	22-29	0-5
	46-80	7.4-8.4	0.0-1.0	1.0-15	5-30
MrA:					
Milford---------	0-11	6.1-7.3	4.0-6.0	26-36	0
	11-24	5.6-7.3	0.5-2.0	22-29	0
	24-46	6.1-7.8	0.5-2.0	22-29	0-5
	46-73	7.4-8.4	0.0-1.0	1.0-15	5-30
	73-80	7.4-8.4	0.0-0.5	0.0-3.0	5-30
MsA:					
Millsdale-------	0-16	6.1-7.3	4.0-7.0	20-36	0
	16-25	6.1-8.4	0.5-2.0	15-30	0-15
	25-32	---	0.0-0.0	0.0-0.0	0
MtA:					
Millsdale-------	0-14	6.1-7.3	4.0-7.0	20-36	0
	14-30	6.1-8.4	0.5-2.0	15-30	0-15
	30-38	---	0.0-0.0	0.0-0.0	0
MuA:					
Milton----------	0-9	5.1-7.3	1.0-3.0	10-22	0
	9-31	4.5-7.8	0.1-0.3	16-30	5-15
	31-60	---	0.0-0.0	0.0-0.0	0

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
MuB:					
Milton----------	0-9	5.1-7.3	1.0-3.0	10-22	0
	9-28	4.5-7.8	0.1-0.3	16-30	5-15
	28-60	---	0.0-0.0	0.0-0.0	0
MuB2:					
Milton----------	0-5	5.1-7.3	0.8-2.2	8.0-20	0
	5-24	4.5-7.8	0.3-1.0	16-30	0
	24-28	6.1-7.8	0.1-0.3	10-27	5-15
	28-35	---	0.0-0.0	0.0-0.0	0
MuC2:					
Milton----------	0-3	5.1-7.3	0.8-2.2	8.0-20	0
	3-25	4.5-7.8	0.3-1.0	16-30	0
	25-28	6.1-7.8	0.1-0.3	10-27	5-15
	28-35	---	0.0-0.0	0.0-0.0	0
MuD2:					
Milton----------	0-5	5.1-7.3	0.8-2.2	8.0-20	0
	5-25	4.5-7.8	0.3-1.0	16-30	0
	25-29	6.1-7.8	0.1-0.3	10-27	5-15
	29-36	---	0.0-0.0	0.0-0.0	0
MuE2:					
Milton----------	0-4	5.1-7.3	0.8-2.2	8.0-20	0
	4-16	4.5-7.8	0.3-1.0	16-30	0
	16-23	6.1-7.8	0.1-0.3	10-27	5-15
	23-35	---	0.0-0.0	0.0-0.0	0
MwA:					
Morningsun------	0-10	4.5-7.3	1.0-3.0	11-23	0
	10-33	4.5-7.3	0.5-1.0	10-19	0
	33-42	6.6-7.8	0.5-1.0	10-19	0
	42-51	6.6-8.4	0.2-0.5	16-23	0-5
	51-80	7.4-8.4	0.0-0.0	10-19	20-40
MxA:					
Morningsun------	0-11	4.5-7.3	1.0-3.0	11-23	0
	11-38	4.5-7.3	0.5-1.0	10-19	0
	38-45	6.6-7.8	0.5-1.0	10-19	0
	45-58	6.6-8.4	0.2-0.5	16-23	0-5
	58-80	7.4-8.4	0.0-0.0	10-19	20-40
Xenia-----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-30	4.5-7.3	0.2-1.0	10-23	0
	30-45	6.6-8.4	0.0-0.5	9.0-23	0-5
	45-80	7.4-8.4	0.0-0.0	4.0-13	15-40
MxB:					
Morningsun------	0-10	4.5-7.3	1.0-3.0	11-23	0
	10-34	4.5-7.3	0.5-1.0	10-19	0
	34-48	6.6-8.4	0.2-0.5	16-23	0-5
	48-80	7.4-8.4	0.0-0.0	10-19	20-40
Xenia-----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-30	4.5-7.3	0.2-1.0	10-23	0
	30-50	6.6-8.4	0.0-0.2	9.0-23	0-5
	50-80	7.4-8.4	0.0-0.0	4.0-13	15-40

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
MxB2:					
Morningsun------	0-6	4.5-7.3	0.8-2.2	10-22	0
	6-26	4.5-7.3	0.5-1.0	10-19	0
	26-31	6.6-7.8	0.5-1.0	10-19	0
	31-50	6.6-8.4	0.2-0.5	16-23	0-5
	50-80	7.4-8.4	0.0-0.0	10-19	20-40
Xenia-----------	0-5	5.6-7.3	0.8-2.2	5.0-18	0
	5-28	4.5-7.3	0.2-1.0	10-23	0
	28-45	6.6-8.4	0.0-0.2	9.0-23	0-5
	45-80	7.4-8.4	0.0-0.0	4.0-13	15-40
MyA:					
Mahalasville----	0-12	6.1-7.3	2.0-5.0	17-21	0
	12-39	6.1-7.3	0.5-2.0	12-25	0
	39-44	6.6-7.8	0.5-1.0	9.0-23	0-30
	44-80	7.4-8.4	0.5-1.0	1.0-7.0	10-30
OcA:					
Ockley----------	0-9	5.6-7.3	0.5-3.0	3.0-15	0
	9-48	4.5-7.3	0.0-0.5	2.0-15	0
	48-80	7.4-8.4	0.0-0.2	1.0-3.0	10-40
OcB:					
Ockley----------	0-9	5.6-7.3	0.5-3.0	3.0-15	0
	9-50	4.5-7.3	0.0-0.5	2.0-15	0
	50-80	7.4-8.4	0.0-0.2	1.0-3.0	10-40
Pg, Pq.					
Pits					
PtB:					
Plattville------	0-18	5.6-7.3	2.0-4.0	10-24	0
	18-43	5.6-7.8	0.5-1.0	11-23	0
	43-54	6.6-8.4	0.0-0.0	4.0-17	0-30
	54-57	---	0.0-0.0	0.0-0.0	0
RaA:					
Rainsville------	0-8	5.1-7.3	1.0-3.0	7.0-21	0
	8-15	5.1-7.3	0.5-1.0	11-20	0
	15-35	4.5-6.0	0.5-1.0	13-22	0
	35-55	6.6-7.8	0.5-1.0	13-22	0-15
	55-80	7.4-8.4	0.0-0.5	6.0-14	15-40
RaB:					
Rainsville------	0-10	5.1-7.3	1.0-3.0	6.0-20	0
	10-16	5.1-7.3	0.5-1.0	11-20	0
	16-44	4.5-6.0	0.5-1.0	13-22	0
	44-50	6.6-7.8	0.5-1.0	13-22	0-15
	50-80	7.4-8.4	0.0-0.5	6.0-14	15-40
RaB2:					
Rainsville------	0-6	5.1-7.3	0.8-2.2	7.0-21	0
	6-36	4.5-6.0	0.5-1.0	13-22	0
	36-52	6.6-7.8	0.5-1.0	13-22	0-15
	52-80	7.4-8.4	0.0-0.5	6.0-14	15-40

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
RcA:					
Randolph--------	0-10	4.5-7.3	1.0-3.0	8.0-22	0
	10-27	4.5-7.8	0.5-1.0	14-30	0
	27-33	6.6-8.4	0.0-0.0	8.0-20	0-15
	33-35	---	0.0-0.0	0.0-0.0	0
RcB:					
Randolph--------	0-8	4.5-7.3	1.0-3.0	8.0-22	0
	8-23	4.5-7.8	0.5-1.0	14-30	0
	23-32	6.6-8.4	0.0-0.0	8.0-20	0-15
	32-35	---	0.0-0.0	0.0-0.0	0
RnE2:					
Rodman----------	0-8	6.6-7.8	2.0-4.0	5.0-18	0-15
	8-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
RnF2:					
Rodman----------	0-4	6.6-7.8	2.0-4.0	5.0-18	0-15
	4-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
RoE2:					
Rodman----------	0-8	6.6-7.8	2.0-4.0	5.0-18	0-15
	8-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
Kendallville----	0-12	5.6-7.3	0.8-2.2	4.0-18	0
	12-49	5.6-7.8	0.1-0.5	10-28	0
	49-80	7.4-8.4	0.1-0.3	7.0-18	20-45
RoF2:					
Rodman----------	0-4	6.6-7.8	2.0-4.0	5.0-18	0-15
	4-12	6.6-7.8	0.0-2.0	1.0-14	0-25
	12-80	7.4-8.4	0.0-1.0	1.0-6.0	10-45
Kendallville----	0-7	5.6-7.3	0.8-2.2	4.0-18	0
	7-40	5.6-7.8	0.1-0.5	10-28	0
	40-80	7.4-8.4	0.1-0.3	7.0-18	20-45
RpA:					
Rossburg--------	0-18	6.1-7.8	4.0-8.0	13-32	0
	18-35	6.1-7.8	0.5-2.0	8.0-22	0
	35-52	6.6-8.4	0.5-2.0	2.0-15	0-30
	52-80	6.6-8.4	0.5-2.0	2.0-8.0	0-30
RuB:					
Russell---------	0-8	5.1-7.3	0.5-2.0	5.0-19	0
	8-35	4.5-7.3	0.5-1.0	11-22	0
	35-58	5.1-7.3	0.0-1.0	9.0-22	0
	58-80	7.4-8.4	0.0-0.5	5.0-18	15-35
Miamian---------	0-5	5.6-7.3	1.0-3.0	10-18	0
	5-10	4.5-7.3	0.5-1.0	12-22	0
	10-32	5.1-8.4	0.3-1.0	17-28	0-15
	32-80	7.4-8.4	0.1-0.5	7.0-16	25-50

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
RuB2:					
Russell---------	0-6	5.1-7.3	0.5-2.0	4.0-18	0
	6-32	4.5-7.3	0.5-1.0	11-22	0
	32-50	5.1-7.3	0.0-1.0	9.0-22	0
	50-80	7.4-8.4	0.0-0.5	5.0-18	15-35
Miamian---------	0-4	5.6-7.3	0.8-2.2	9.0-17	0
	4-26	4.5-7.3	0.5-1.0	12-22	0
	26-33	5.1-8.4	0.3-1.0	17-28	0-15
	33-80	7.4-8.4	0.1-0.5	7.0-16	25-50
SeA:					
Savona----------	0-7	5.6-7.3	0.5-3.0	10-21	0
	7-29	5.6-7.3	0.1-0.5	14-25	0-5
	29-45	7.4-8.4	0.0-0.0	8.0-18	30-55
	45-80	7.4-8.4	0.0-0.0	1.0-6.0	40-65
SnA:					
Sloan-----------	0-10	6.1-7.8	3.0-6.0	13-26	0
	10-45	6.6-8.4	0.5-2.0	10-20	0-10
	45-60	6.6-8.4	0.5-2.0	4.0-18	0-25
	60-80	6.6-8.4	0.5-2.0	2.0-8.0	0-30
StA:					
Stonelick-------	0-10	7.4-8.4	0.5-2.0	12-18	10-25
	10-30	7.4-8.4	0.0-0.1	8.0-12	25-50
	30-80	7.4-8.4	0.0-0.1	6.0-10	25-50
SvA:					
Sugarvalley-----	0-10	4.5-7.3	1.0-3.0	10-26	0
	10-41	5.1-7.3	0.5-1.0	12-25	0
	41-51	6.6-7.8	0.5-1.0	10-19	0
	51-61	6.6-8.4	0.2-0.5	8.0-15	0-5
	61-80	7.4-8.4	0.0-0.0	5.0-15	20-40
SwA:					
Sugarvalley-----	0-9	4.5-7.3	1.0-3.0	10-26	0
	9-30	5.1-7.3	0.5-1.0	12-25	0
	30-50	6.6-7.8	0.5-1.0	10-19	0
	50-80	7.4-8.4	0.0-0.0	5.0-15	20-40
Fincastle-------	0-11	5.1-7.3	1.0-3.0	6.0-20	0
	11-32	4.5-6.5	0.0-0.5	9.0-23	0
	32-48	5.1-7.8	0.0-0.0	10-20	0-25
	48-80	7.4-8.4	0.0-0.0	8.0-16	15-35
ThA:					
Thackery--------	0-12	5.6-7.3	1.0-3.0	8.0-21	0
	12-21	5.1-6.5	0.1-0.5	8.0-20	0
	21-54	5.1-7.8	0.0-0.0	10-21	0-15
	54-80	7.4-8.4	0.0-0.0	1.0-6.0	10-40
ThB:					
Thackery--------	0-12	5.6-7.3	1.0-3.0	8.0-21	0
	12-67	5.1-7.8	0.0-0.0	10-21	0-15
	67-80	7.4-8.4	0.0-0.0	1.0-6.0	10-40
Ud.					
Udorthents					

Table 24.—Chemical Properties of the Soils—Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	Pct
W.					
Water					
WbA:					
Warsaw----------	0-12	5.6-7.3	2.0-5.0	10-25	0
	12-21	5.1-6.5	0.5-2.0	7.0-22	0
	21-30	6.1-8.4	0.5-2.0	9.0-22	0-10
	30-80	7.4-8.4	0.0-1.0	1.0-7.0	15-25
WnA:					
Westland--------	0-12	6.1-7.3	2.0-5.0	15-31	0
	12-20	6.1-7.3	0.5-2.0	9.0-22	0
	20-51	6.1-7.8	0.5-2.0	5.0-18	0-25
	51-80	7.4-8.4	0.0-0.5	0.0-2.0	25-45
WyB:					
Wynn------------	0-8	5.1-7.3	1.0-3.0	9.0-22	0
	8-14	5.1-6.5	0.0-0.5	18-24	0
	14-31	6.1-8.4	0.0-0.0	16-24	0-15
	31-35	---	0.0-0.0	0.0-0.0	0
WyB2:					
Wynn------------	0-8	5.1-7.3	0.8-2.2	8.0-21	0
	8-23	5.1-6.5	0.0-0.5	18-24	0
	23-28	6.1-8.4	0.0-0.0	16-24	0-15
	28-38	---	0.0-0.0	0.0-0.0	0
WyC2:					
Wynn------------	0-5	5.1-7.3	0.8-2.2	8.0-21	0
	5-23	6.1-8.4	0.0-0.5	18-24	0-10
	23-38	---	---	0.0-0.0	0
WyD2:					
Wynn------------	0-5	5.1-7.3	0.8-2.2	8.0-21	0
	5-28	6.1-8.4	0.0-0.5	18-24	0-10
	28-38	---	0.0-0.0	0.0-0.0	0
XeA:					
Xenia-----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-38	4.5-7.3	0.2-1.0	10-23	0
	38-48	6.6-8.4	0.0-0.5	9.0-23	0-25
	48-80	7.4-8.4	0.0-0.0	4.0-13	15-40
XeB:					
Xenia-----------	0-9	5.6-7.3	1.0-3.0	6.0-20	0
	9-29	4.5-7.3	0.2-1.0	10-23	0
	29-58	6.6-8.4	0.0-0.5	9.0-23	0-25
	58-80	7.4-8.4	0.0-0.0	4.0-13	15-40
XeB2:					
Xenia-----------	0-6	5.6-7.3	0.8-2.2	5.0-19	0
	6-24	4.5-7.3	0.2-1.0	10-23	0
	24-44	6.6-8.4	0.0-0.5	9.0-23	0-25
	44-80	7.4-8.4	0.0-0.0	4.0-13	15-40
XfB:					
Xenia-----------	0-8	5.6-7.3	1.0-3.0	6.0-20	0
	8-26	4.5-7.3	0.2-1.0	10-23	0
	26-46	6.6-8.4	0.0-0.5	9.0-23	0-25
	46-61	7.4-8.4	0.0-0.0	4.0-13	15-40
	61-65	---	0.0-0.0	0.0-0.0	0

Table 25.—Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
CeA, CeB, CeB2:										
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CoA:										
Corwin----------	B	Jan-Apr	1.5-2.5	2.0-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	2.0-3.5	Perched	---	---	None	---	None
CtA, CtB:										
Crosby----------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CvA:										
Crosby----------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
CyA:										
Cyclone---------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
DaA, DaB:										
Dana------------	B	Jan	---	---	---	---	---	None	---	None
		Feb-Apr	2.0-3.0	3.5-6.0	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
EeA:										
Eel-------------	A	Jan-Apr	1.5-2.0	>6.0	Apparent	---	---	None	Brief	Occasional
		May-Jun	---	---	---	---	---	None	Brief	Occasional
		Jul-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.0	>6.0	Apparent	---	---	None	Brief	Occasional

Table 25.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
EgA, EgB, EgB2, EhC3, EhD3, EkA, EkB, EkB2:										
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
FcA, FdA:										
Fincastle-------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
FmA, FmB, FmB2:										
Fox-------------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
HeF2:										
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
HwE2, HwF2:										
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Wynn------------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
KeC2, KeD2:										
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Eldean----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
KnA, KoA:										
Kokomo----------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
LeB, LfB2:										
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LgC3:										
Lewisburg-------	C	Jan-Apr	0.5-2.0	1.5-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
LpA:										
Lippincott------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None

Table 25.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
MaA:										
Medway----------	B	Jan-Mar	2.0-3.0	>6.0	Apparent	---	---	None	Brief	Occasional
		Apr-Jun	---	---	---	---	---	None	Brief	Occasional
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov	---	---	---	---	---	None	Brief	Occasional
		Dec	2.0-3.0	>6.0	Apparent	---	---	None	Brief	Occasional
MbB2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
McE2, McF2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MdC2, MdD2:										
Miami-----------	B	Jan-Apr	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.0	2.5-3.5	Perched	---	---	None	---	None
MeC, MeC2, MeD2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
MfB, MfB2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Celina----------	C	Jan-Apr	1.5-3.0	1.6-3.5	Perched	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
MgE2, MgF2:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Kendallville----	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MhC3, MhD3:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Losantville-----	C	Jan-Apr	1.0-2.0	3.0-4.0	Perched	---	---	None	---	None
		May-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	1.0-2.0	3.0-4.0	Perched	---	---	None	---	None

Table 25.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
MmE2, MnE3:										
Miamian---------	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
Hennepin--------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MpA, MrA:										
Milford---------	B	Jan-May	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-1.0	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
MsA, MtA:										
Millsdale-------	B/D	Jan-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	---	None
MuA, MuB, MuB2, MuC2, MuD2, MuE2:										
Milton---------	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
MwA:										
Morningsun------	B	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
MxA, MxB, MxB2:										
Morningsun------	B	Jan-Apr	2.0-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	>6.0	Apparent	---	---	None	---	None
Xenia-----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
MyA:										
Mahalasville----	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
OcA, OcB:										
Ockley----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Pg, Pq.										
Pits										

Table 25.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
PtB:										
Plattville	B	Jan-Apr	2.5-3.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.5-3.5	>6.0	Apparent	---	---	None	---	None
RaA, RaB, RaB2:										
Rainsville	B	Jan-Apr	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	2.0-3.5	4.0-5.0	Perched	---	---	None	---	None
RcA, RcB:										
Randolph	C	Jan-Apr	0.5-1.0	>6.0	Apparent	---	---	None	---	None
		May-Dec	---	---	---	---	---	None	---	None
RnE2, RnF2:										
Rodman	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
RoE2, RoF2:										
Rodman	A	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kendallville	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
RpA:										
Rossburg	B	Jan-Apr	3.5-6.0	>6.0	Apparent	---	---	None	Brief	Occasional
		May	---	---	---	---	---	None	Brief	Occasional
		Jun-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	---	---	---	---	---	None	Brief	Occasional
RuB, RuB2:										
Russell	B	Jan-Apr	3.5-6.0	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	3.5-6.0	4.0-6.0	Perched	---	---	None	---	None
Miamian	C	Jan-May	2.5-3.5	3.0-4.0	Perched	---	---	None	---	None
		Jun-Dec	---	---	---	---	---	None	---	None
SeA:										
Savona	C	Jan-Apr	0.5-2.5	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-2.5	>6.0	Apparent	---	---	None	---	None
SnA:										
Sloan	B	Jan-Jun	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	Long	Frequent
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	0.0-1.0	>6.0	Apparent	0.0-1.0	Long	Frequent	Long	Frequent

Table 25.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
StA:										
Stonelick-------	B	Jan-Jun	---	---	---	---	---	None	Brief	Frequent
		Jul-Oct	---	---	---	---	---	None	---	None
		Nov-Dec	---	---	---	---	---	None	Brief	Frequent
SvA:										
Sugarvalley-----	C	Jan-Apr	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-2.0	>6.0	Apparent	---	---	None	---	None
SwA:										
Sugarvalley-----	C	Jan-Apr	0.5-2.0	>6.0	Apparent	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-2.0	>6.0	Apparent	---	---	None	---	None
Fincastle-------	C	Jan-Apr	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	0.5-1.5	1.0-2.0	Perched	---	---	None	---	None
ThA:										
Thackery--------	B	Jan-May	1.0-2.5	>6.0	Apparent	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	1.0-2.5	>6.0	Apparent	---	---	None	---	None
ThB:										
Thackery--------	B	Jan-May	2.5-3.5	>6.0	Apparent	---	---	None	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	2.5-3.5	>6.0	Apparent	---	---	None	---	None
Ud.										
Udorthents										
W.										
Water										
WbA:										
Warsaw----------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
WnA:										
Westland--------	B	Jan-May	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
		Jun-Nov	---	---	---	---	---	None	---	None
		Dec	0.0-0.5	>6.0	Apparent	0.0-0.5	Long	Frequent	---	None
WyB, WyB2, WyC2, WyD2:										
Wyn------------	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 25.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Month	Water table			Ponding			Flooding	
			Upper limit	Lower limit	Kind	Surface water depth	Duration	Frequency	Duration	Frequency
XeA, XeB, XeB2, XfB:										
Xenia----------	B	Jan-Apr	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None
		May-Nov	---	---	---	---	---	None	---	None
		Dec	1.5-2.5	4.0-6.0	Perched	---	---	None	---	None

Table 26.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
CeA, CeB, CeB2:						
Celina	Dense material	20-40	Noncemented	High	High	Moderate.
CoA:						
Corwin	Dense material	20-40	Noncemented	Moderate	High	Moderate.
CtA, CtB:						
Crosby	Dense material	20-40	Noncemented	High	High	Moderate.
Celina	Dense material	20-40	Noncemented	High	High	Moderate.
CvA:						
Crosby	Dense material	20-40	Noncemented	High	High	Moderate.
Lewisburg	Dense material	10-20	Noncemented	High	High	Moderate.
CyA:						
Cyclone	---	>80	---	High	High	Low.
DaA, DaB:						
Dana	Dense material	40-70	Noncemented	High	Moderate	Moderate.
EeA:						
Eel	---	>80	---	High	Moderate	Low.
EgA, EgB, EgB2, EhC3, EhD3, EkA, EkB, EkB2:						
Eldean	Strongly contrasting textural stratification	20-40	Noncemented	Moderate	High	Moderate.
FcA:						
Fincastle	Dense material	40-60	Noncemented	High	High	Moderate.
FdA:						
Fincastle	Dense material	40-60	Noncemented	High	High	Moderate.
	Bedrock (paralithic)	55-65	Moderately cemented			
FmA, FmB, FmB2:						
Fox	Strongly contrasting textural stratification	24-40	Noncemented	Moderate	Moderate	Moderate.
HeF2:						
Hennepin	Dense material	10-20	Noncemented	Moderate	Low	Low.
Miamian	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.

Table 26.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
HwE2, HwF2:						
Hennepin----------	Dense material	10-20	Noncemented	Moderate----	Low---------	Low.
Wynn--------------	Bedrock (paralithic)	20-40	Moderately cemented	Moderate----	High--------	Low.
KeC2, KeD2:						
Kendallville-------	Dense material	20-40	Noncemented	Moderate----	Moderate----	Moderate.
Eldean------------	Strongly contrasting textural stratification	20-40	Noncemented	Moderate----	High--------	Moderate.
KnA, KoA:						
Kokomo------------	---	>80	---	High--------	High--------	Low.
LeB, LfB2:						
Lewisburg----------	Dense material	10-20	Noncemented	High--------	Moderate----	Moderate.
Celina------------	Dense material	20-40	Noncemented	High--------	High--------	Moderate.
LgC3:						
Lewisburg----------	Dense material	10-20	Noncemented	High--------	Moderate----	Moderate.
LpA:						
Lippincott---------	Strongly contrasting textural stratification	20-40	Noncemented	High--------	High--------	Low.
MaA:						
Medway------------	---	>80	---	High--------	High--------	Low.
MbB2:						
Miami-------------	Dense material	24-40	Noncemented	Moderate----	Moderate----	Low.
McE2:						
Miami-------------	Dense material	24-40	Noncemented	Moderate----	Moderate----	Low.
Kendallville-------	Dense material	20-40	Noncemented	Moderate----	Moderate----	Moderate.
McF2:						
Miami-------------	Dense material	24-40	Noncemented	Moderate----	Moderate----	Low.
Kendallville-------	Dense material	20-43	Noncemented	Moderate----	Moderate----	Moderate.
MdC2, MdD2:						
Miami-------------	Dense material	24-40	Noncemented	Moderate----	Moderate----	Low.
MeC, MeC2, MeD2:						
Miamian-----------	Dense material	20-40	Noncemented	Moderate----	Moderate----	Moderate.
MfB, MfB2:						
Miamian-----------	Dense material	20-40	Noncemented	Moderate----	Moderate----	Moderate.
Celina------------	Dense material	20-40	Noncemented	High--------	High--------	Moderate.

Table 26.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
MgE2, MgF2:						
Miamian	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.
Kendallville	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.
MhC3, MhD3:						
Miamian	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.
Losantville	Dense material	12-20	Noncemented	Moderate	Moderate	Low.
MmE2, MnE3:						
Miamian	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.
Hennepin	Dense material	10-20	Noncemented	Moderate	Low	Low.
MpA, MrA:						
Milford	---	>80	---	High	High	Low.
MsA, MtA:						
Millsdale	Bedrock (lithic)	20-40	Strongly cemented	High	High	Low.
MuA, MuB, MuB2, MuC2, MuD2, MuE2:						
Milton	Bedrock (lithic)	20-40	Strongly cemented	Moderate	High	Moderate.
MwA:						
Morningsun	---	>80	---	High	High	Moderate.
MxA, MxB, MxB2:						
Morningsun	---	>80	---	High	High	Moderate.
Xenia	Dense material	40-60	Noncemented	High	High	Moderate.
MyA:						
Mahalasville	---	>80	---	High	High	Low.
OcA, OcB:						
Ockley	Strongly contrasting textural stratification	40-72	Noncemented	Moderate	Moderate	Moderate.
Pg, Pq.						
Pits						
PtB:						
Plattville	Bedrock (lithic)	40-60	Strongly cemented	Moderate	High	Moderate.
RaA, RaB, RaB2:						
Rainsville	---	>80	---	Moderate	Moderate	Moderate.
RcA, RcB:						
Randolph	Bedrock (lithic)	20-40	Strongly cemented	High	High	Moderate.
RnE2, RnF2:						
Rodman	---	>80	---	Low	Low	Low.

Table 26.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
RoE2, RoF2:						
Rodman	---	>80	---	Low	Low	Low.
Kendallville	Dense material	28-53	Noncemented	Moderate	Moderate	Moderate.
RpA:						
Rossburg	---	>80	---	Moderate	Low	Low.
RuB:						
Russell	Dense material	40-65	Noncemented	High	Moderate	Moderate.
Miamian	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.
RuB2:						
Russell	Dense material	40-63	Noncemented	High	Moderate	Moderate.
Miamian	Dense material	20-40	Noncemented	Moderate	Moderate	Moderate.
SeA:						
Savona	Strongly contrasting textural stratification	30-50	Noncemented	High	High	Low.
SnA:						
Sloan	---	>80	---	High	High	Low.
StA:						
Stonelick	---	>80	---	Moderate	Low	Low.
SvA:						
Sugarvalley	---	>80	---	High	High	Moderate.
SwA:						
Sugarvalley	---	>80	---	High	High	Moderate.
Fincastle	Dense material	40-60	Noncemented	High	High	Moderate.
ThA, ThB:						
Thackery	Strongly contrasting textural stratification	35-70	Noncemented	High	Moderate	Moderate.
Ud.						
Udorthents						
W.						
Water						
WbA:						
Warsaw	Strongly contrasting textural stratification	20-40	Noncemented	Moderate	Low	Moderate.

Table 26.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
WnA:						
Westland	Strongly contrasting textural stratification	40-60	Noncemented	High	High	Low.
WyB, WyB2, WyC2, WyD2:						
Wynn	Bedrock (paralithic)	20-40	Moderately cemented	Moderate	High	Low.
XeA, XeB, XeB2:						
Xenia	Dense material	40-60	Noncemented	High	High	Moderate.
XfB:						
Xenia	Dense material	40-60	Noncemented	High	High	Moderate.
	Bedrock (paralithic)	55-65	Moderately cemented			

Table 27.—Classification of the Soils

(One asterisk in the first column indicates that these soils in the survey area are taxadjuncts to the series. Two asterisks in the first column indicate that only certain map units of these soils are taxadjuncts to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
*Celina	Fine, mixed, active, mesic Aquic Hapludalfs
Corwin	Fine-loamy, mixed, active, mesic Oxyaquic Argiudolls
Crosby	Fine, mixed, active, mesic Aeric Epiaqualfs
Cyclone	Fine-silty, mixed, superactive, mesic Typic Argiaquolls
Dana	Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls
Eel	Fine-loamy, mixed, superactive, mesic Fluvaquentic Eutrudepts
Eldean	Fine, mixed, superactive, mesic Typic Hapludalfs
Fincastle	Fine-silty, mixed, superactive, mesic Aeric Epiaqualfs
**Fox	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfs
*Hennepin	Fine-loamy, mixed, active, mesic Typic Eutrudepts
Kendallville	Fine-loamy, mixed, superactive, mesic Typic Hapludalfs
Kokomo	Fine, mixed, superactive, mesic Typic Argiaquolls
Lewisburg	Clayey, mixed, active, mesic, shallow Aquic Hapludalfs
Lippincott	Fine, mixed, superactive, mesic Typic Argiaquolls
Losantville	Clayey, mixed, active, mesic, shallow Oxyaquic Hapludalfs
Mahalasville	Fine-silty, mixed, superactive, mesic Typic Argiaquolls
*Medway	Fine-loamy, mixed, superactive, mesic Fluvaquentic Hapludolls
Miami	Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs
Miamian	Fine, mixed, active, mesic Oxyaquic Hapludalfs
Milford	Fine, mixed, superactive, mesic Typic Endoaquolls
Millsdale	Fine, mixed, active, mesic Typic Argiaquolls
Milton	Fine, mixed, active, mesic Typic Hapludalfs
Morningsun	Fine-silty, mixed, superactive, mesic Oxyaquic Hapludalfs
Ockley	Fine-loamy, mixed, active, mesic Typic Hapludalfs
*Plattville	Fine-loamy, mixed, active, mesic Typic Argiudolls
Rainsville	Fine-loamy, mixed, active, mesic Oxyaquic Hapludalfs
Randolph	Fine, mixed, active, mesic Aeric Endoaqualfs
Rodman	Sandy-skeletal, mixed, mesic Typic Hapludolls
Rossburg	Fine-loamy, mixed, superactive, mesic Fluventic Hapludolls
Russell	Fine-silty, mixed, superactive, mesic Typic Hapludalfs
Savona	Fine, mixed, superactive, mesic Aeric Endoaqualfs
Sloan	Fine-loamy, mixed, superactive, mesic Fluvaquentic Endoaquolls
Stonelick	Coarse-loamy, mixed, superactive, calcareous, mesic Typic Udifluvents
Sugarvalley	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs
**Thackery	Fine-loamy, mixed, active, mesic Aquic Hapludalfs
Udorthents	Typic Udorthents
Warsaw	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls
Westland	Fine-loamy, mixed, superactive, mesic Typic Argiaquolls
Wynn	Fine, mixed, superactive, mesic Typic Hapludalfs
Xenia	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Table 28.—Interpretive Groups

(A complex is treated as a single management unit in the "Land capability classification" and "Prime farmland" columns. See text for definitions of the groups. Absence of an entry indicates that the map unit is not suited to intended use or is not rated)

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
CeA------------------ Celina	1	A-6	All areas are prime farmland	No
CeB, CeB2------------ Celina	2e	A-6	All areas are prime farmland	No
CoA------------------ Corwin	1	A-1	All areas are prime farmland	No
CtA------------------	2w		Prime farmland if drained	
Crosby--------------		C-1		No
Celina--------------		A-6		No
CtB------------------	2e		Prime farmland if drained	
Crosby--------------		C-1		No
Celina--------------		A-6		No
CvA------------------	2w		Prime farmland if drained	
Crosby--------------		C-1		No
Lewisburg-----------		A-6		No
CyA------------------ Cyclone	2w	C-1	Prime farmland if drained	Yes
DaA------------------ Dana	1	A-6	All areas are prime farmland	No
DaB------------------ Dana	2e	A-6	All areas are prime farmland	No
EeA------------------ Eel	2w	A-5	All areas are prime farmland	No
EgA------------------ Eldean	2s	B-1	All areas are prime farmland	No
EgB, EgB2------------ Eldean	2e	B-1	All areas are prime farmland	No
EhC3----------------- Eldean	4e	B-1	Not prime farmland	No
EhD3----------------- Eldean	6e	B-1	Not prime farmland	No
EkA------------------ Eldean	2s	B-1	All areas are prime farmland	No
EkB, EkB2------------ Eldean	2e	B-1	All areas are prime farmland	No
FcA, FdA------------- Fincastle	2w	C-1	Prime farmland if drained	No

Table 28.—Interpretive Groups—Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
FmA------------------ Fox	2s	A-1	All areas are prime farmland	No
FmB, FmB2------------ Fox	2e	A-1	All areas are prime farmland	No
HeF2-----------------	7e		Not prime farmland	
Hennepin------------		A-3		No
Miamian-------------		A-3		No
HwE2-----------------	6e		Not prime farmland	
Hennepin------------		A-2		No
Wynn----------------		F-1		No
HwF2-----------------	7e		Not prime farmland	
Hennepin------------		A-3		No
Wynn----------------		F-2		No
KeC2-----------------	3e		Not prime farmland	
Kendallville--------		A-1		No
Eldean--------------		B-1		No
KeD2-----------------	4e		Not prime farmland	
Kendallville--------		A-1		No
Eldean--------------		B-1		No
KnA, KoA------------- Kokomo	2w	C-1	Prime farmland if drained	Yes
LeB, LfB2------------	2e		All areas are prime farmland	
Lewisburg-----------		A-6		No
Celina--------------		A-6		No
LgC3----------------- Lewisburg	4e	A-6	Not prime farmland	No
LpA------------------ Lippincott	2w	C-1	Prime farmland if drained	Yes
MaA------------------ Medway	2w	A-5	All areas are prime farmland	No
MbB2----------------- Miami	2e	B-1	All areas are prime farmland	No
McE2-----------------	6e		Not prime farmland	
Miami---------------		B-1		No
Kendallville--------		A-2		No
McF2-----------------	7e		Not prime farmland	
Miami---------------		B-2		No
Kendallville--------		A-3		No
MdC2----------------- Miami	3e	B-1	Not prime farmland	No
MdD2----------------- Miami	4e	B-1	Not prime farmland	No
MeC, MeC2------------ Miamian	3e	A-1	Not prime farmland	No

Table 28.—Interpretive Groups—Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
MeD2------------------ Miamian	4e	A-1	Not prime farmland	No
MfB, MfB2------------	2e		All areas are prime farmland	
Miamian-------------		A-1		No
Celina--------------		A-6		No
MgE2-----------------	6e		Not prime farmland	
Miamian-------------		A-2		No
Kendallville--------		A-2		No
MgF2-----------------	7e		Not prime farmland	
Miamian-------------		A-3		No
Kendallville--------		A-3		No
MhC3-----------------	4e		Not prime farmland	
Miamian-------------		A-1		No
Losantville---------		B-1		No
MhD3-----------------	6e		Not prime farmland	
Miamian-------------		A-1		No
Losantville---------		B-1		No
MmE2-----------------	6e		Not prime farmland	
Miamian-------------		A-2		No
Hennepin------------		A-2		No
MnE3-----------------	7e		Not prime farmland	
Miamian-------------		A-2		No
Hennepin------------		A-2		No
MpA, MrA------------- Milford	2w	C-1	Prime farmland if drained	Yes
MsA, MtA------------- Millsdale	4w	C-2	Prime farmland if drained	Yes
MuA------------------ Milton	2s	F-1	All areas are prime farmland	No
MuB, MuB2------------ Milton	2e	F-1	All areas are prime farmland	No
MuC2----------------- Milton	3e	F-1	Not prime farmland	No
MuD2----------------- Milton	4e	F-1	Not prime farmland	No
MuE2----------------- Milton	6e	F-1	Not prime farmland	No
MwA------------------ Morningsun	1	A-6	All areas are prime farmland	No
MxA------------------	1		All areas are prime farmland	
Morningsun----------		A-6		No
Xenia---------------		A-6		No

Table 28.—Interpretive Groups—Continued

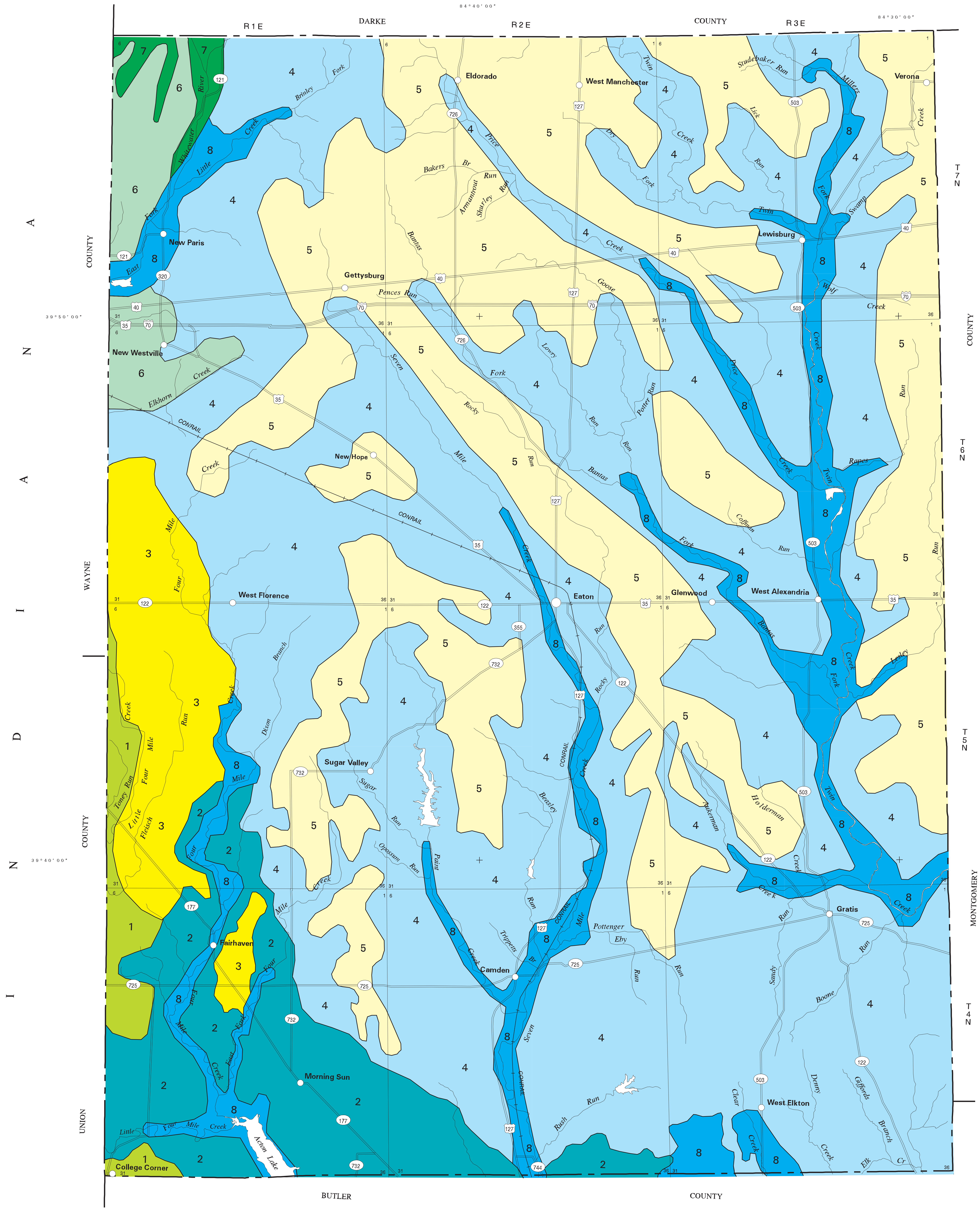
Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
MxB, MxB2------------	2e		All areas are prime farmland	
Morningsun----------		A-6		No
Xenia---------------		A-6		No
MyA------------------ Mahalasville	2w	C-1	Prime farmland if drained	Yes
OcA------------------ Ockley	1	B-1	All areas are prime farmland	No
OcB------------------ Ockley	2e	B-1	All areas are prime farmland	No
Pg, Pq--------------- Pits	---	Not rated	Not prime farmland	Unranked
PtB------------------ Plattville	2e	A-1	All areas are prime farmland	No
RaA------------------ Rainsville	1	A-1	All areas are prime farmland	No
RaB, RaB2------------ Rainsville	2e	A-1	All areas are prime farmland	No
RcA------------------ Randolph	3w	C-2	Prime farmland if drained	No
RcB------------------ Randolph	3e	C-2	Prime farmland if drained	No
RnE2----------------- Rodman	7s	B-1	Not prime farmland	No
RnF2----------------- Rodman	7s	B-2	Not prime farmland	No
RoE2-----------------	7s		Not prime farmland	
Rodman--------------		B-1		No
Kendallville--------		A-2		No
RoF2-----------------	7s		Not prime farmland	
Rodman--------------		B-2		No
Kendallville--------		A-3		No
RpA------------------ Rossburg	2w	A-5	All areas are prime farmland	No
RuB, RuB2------------	2e		All areas are prime farmland	
Russell-------------		A-6		No
Miamian-------------		A-1		No
SeA------------------ Savona	2w	C-1	Prime farmland if drained	No

Table 28.—Interpretive Groups—Continued

Map symbol and soil name	Land capability classification	Pasture and hayland suitability group	Prime farmland	Hydric
SnA------------------ Sloan	3w	C-3	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	Yes
StA------------------ Stonelick	3w	A-5	Prime farmland if protected from flooding or not frequently flooded during the growing season	No
SvA------------------ Sugarvalley	2w	C-1	Prime farmland if drained	No
SwA------------------	2w		Prime farmland if drained	
Sugarvalley---------		C-1		No
Fincastle-----------		C-1		No
ThA------------------ Thackery	1	A-6	All areas are prime farmland	No
ThB------------------ Thackery	2e	A-6	All areas are prime farmland	No
Ud------------------- Udorthents	---	Not rated	Not prime farmland	Unranked
W-------------------- Water	---	Not rated	Not prime farmland	Unranked
WbA------------------ Warsaw	2s	A-1	All areas are prime farmland	No
WnA------------------ Westland	2w	C-1	Prime farmland if drained	Yes
WyB, WyB2------------ Wynn	2e	F-1	All areas are prime farmland	No
WyC2----------------- Wynn	3e	F-1	Not prime farmland	No
WyD2----------------- Wynn	4e	F-1	Not prime farmland	No
XeA------------------ Xenia	1	A-6	All areas are prime farmland	No
XeB, XeB2, XfB------- Xenia	2e	A-6	All areas are prime farmland	No

NRCS Accessibility Statement

The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.



LEGEND

1	Fincastle-Cyclone-Xenia
2	Xenia-Miamian-Fincastle
3	Cyclone-Sugarvalley-Morningsun
4	Celina-Miamian-Kokomo
5	Kokomo-Crosby-Celina
6	Miami-Kendallville
7	Eldean-Lippincott
8	Eldean-Stonelick-Rossburg

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

N

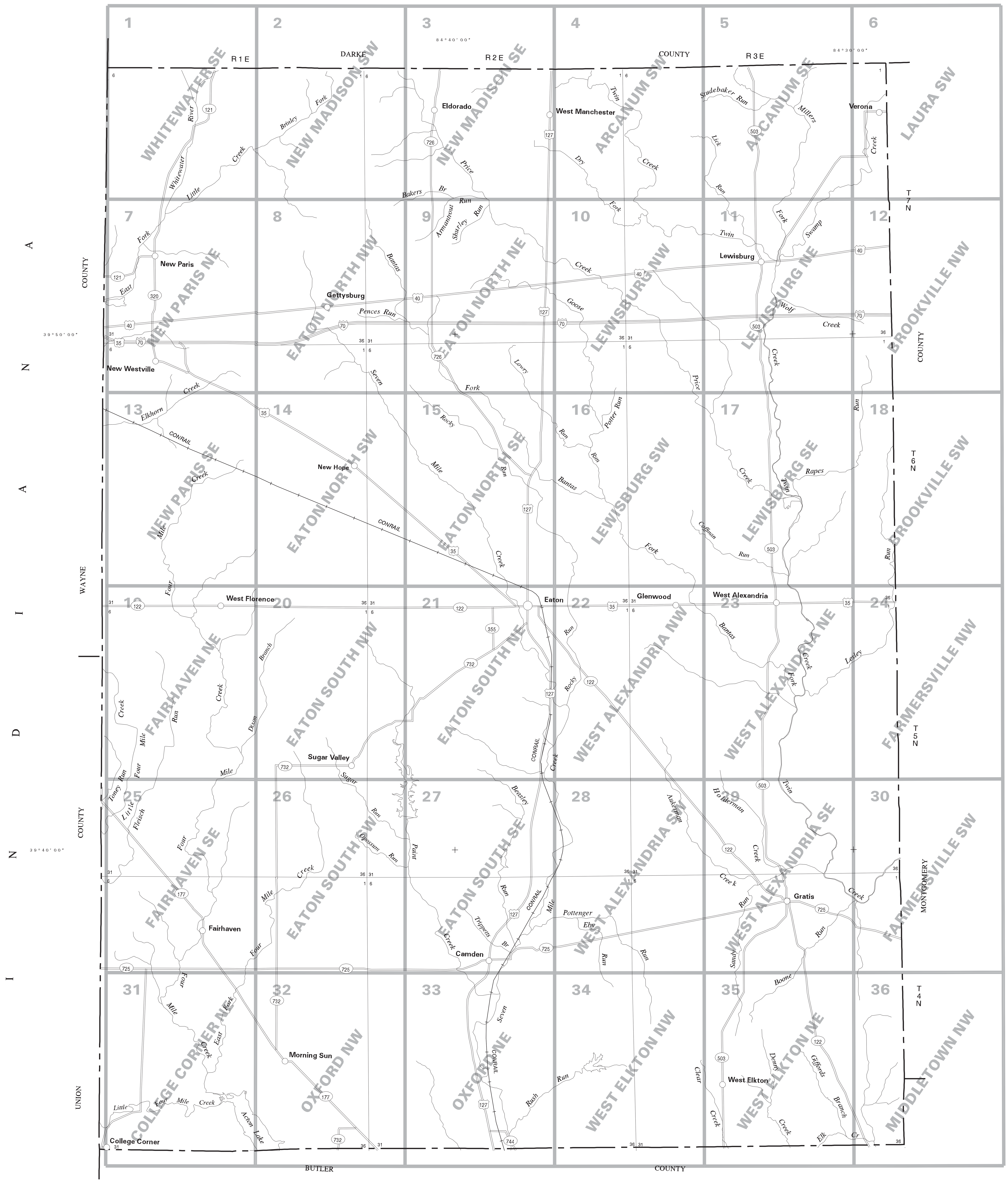
UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF SOIL AND WATER CONSERVATION
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
OHIO STATE UNIVERSITY EXTENSION
PREBLE SOIL AND WATER CONSERVATION DISTRICT
PREBLE COUNTY COMMISSIONERS

GENERAL SOIL MAP
PREBLE COUNTY, OHIO

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

SCALE = 1:85000



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

N

INDEX TO MAP SHEETS
PREBLE COUNTY, OHIO

MILES

KILOMETERS

SCALE = 1:85000

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO

OHIO DEPARTMENT OF NATURAL RESOURCES, DIVISION OF SOIL AND WATER CONSERVATION
OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
OHIO STATE UNIVERSITY EXTENSION
PREBLE SOIL AND WATER CONSERVATION DISTRICT
PREBLE COUNTY COMMISSIONERS

SOIL LEGEND

Map unit symbols consist of a combination of letters or letters and numbers. The first capital letter is the initial one of the map unit name. The lowercase letter that follows separates map units having names that begin with the same letter, except that it does not separate sloping or eroded phases. The second capital letter indicates the class of slope. Symbols without a slope letter are for miscellaneous areas. A final number of 2 indicates that the soil is eroded, and 3 indicates that the soil is severely eroded.

SYMBOL	NAME
CeA	Celina silt loam, 0 to 2 percent slopes
CeB	Celina silt loam, 2 to 6 percent slopes
CeB2	Celina silt loam, 2 to 6 percent slopes, eroded
CoA	Corwin silt loam, 0 to 2 percent slopes
CtA	Crosby-Celina silt loams, 0 to 2 percent slopes
CtB	Crosby-Celina silt loams, 2 to 4 percent slopes
CvA	Crosby-Lewisburg silt loams, 0 to 2 percent slopes
CyA	Cyclone silt loam, 0 to 2 percent slopes
DaA	Dana silt loam, 0 to 2 percent slopes
DaB	Dana silt loam, 2 to 6 percent slopes
EeA	Eel silt loam, gravelly substratum, 0 to 1 percent slopes, occasionally flooded
EgA	Eldean gravelly loam, 0 to 2 percent slopes
EgB	Eldean gravelly loam, 2 to 6 percent slopes
EgB2	Eldean gravelly loam, 2 to 6 percent slopes, eroded
EhC3	Eldean gravelly clay loam, 6 to 12 percent slopes, severely eroded
EhD3	Eldean gravelly clay loam, 12 to 18 percent slopes, severely eroded
EkA	Eldean loam, 0 to 2 percent slopes
EkB	Eldean loam, 2 to 6 percent slopes
EkB2	Eldean loam, 2 to 6 percent slopes, eroded
FcA	Fincastle silt loam, 0 to 2 percent slopes
FdA	Fincastle silt loam, bedrock substratum, 0 to 2 percent slopes
FmA	Fox silt loam, till substratum, 0 to 2 percent slopes
FmB	Fox silt loam, till substratum, 2 to 6 percent slopes
FmB2	Fox silt loam, till substratum, 2 to 6 percent slopes, eroded
HeF2	Hennepin-Miamian silt loams, 25 to 50 percent slopes, eroded
HwE2	Hennepin-Wynn silt loams, 18 to 25 percent slopes, eroded
HwF2	Hennepin-Wynn silt loams, 25 to 50 percent slopes, eroded
KeC2	Kendallville-Eldean silt loams, 6 to 12 percent slopes, eroded
KeD2	Kendallville-Eldean silt loams, 12 to 18 percent slopes, eroded
KnA	Kokomo silt loam, 0 to 1 percent slopes
KoA	Kokomo silty clay loam, 0 to 1 percent slopes
LeB	Lewisburg-Celina silt loams, 2 to 6 percent slopes
LfB2	Lewisburg-Celina clay loams, 2 to 6 percent slopes, eroded
LgC3	Lewisburg clay loam, 6 to 12 percent slopes, severely eroded
LpA	Lippincott silty clay loam, 0 to 2 percent slopes
MaA	Medway silt loam, 0 to 1 percent slopes, occasionally flooded
MbB2	Miami silt loam, 2 to 6 percent slopes, eroded
McE2	Miami-Kendallville silt loams, 18 to 25 percent slopes, eroded
McF2	Miami-Kendallville silt loams, 25 to 50 percent slopes, eroded
MdC2	Miami loam, 6 to 12 percent slopes, eroded
MdD2	Miami loam, 12 to 18 percent slopes, eroded
MeC	Miamian silt loam, 6 to 12 percent slopes
MeC2	Miamian silt loam, 6 to 12 percent slopes, eroded
MeD2	Miamian silt loam, 12 to 18 percent slopes, eroded
MfB	Miamian-Celina silt loams, 2 to 6 percent slopes
MfB2	Miamian-Celina silt loams, 2 to 6 percent slopes, eroded
MgE2	Miamian-Kendallville silt loams, 18 to 25 percent slopes, eroded
MgF2	Miamian-Kendallville silt loams, 25 to 50 percent slopes, eroded
MhC3	Miamian-Losantville clay loams, 6 to 12 percent slopes, severely eroded
MhD3	Miamian-Losantville clay loams, 12 to 18 percent slopes, severely eroded
MmE2	Miamian-Hennepin silt loams, 18 to 25 percent slopes, eroded
MnE3	Miamian-Hennepin clay loams, 18 to 25 percent slopes, severely eroded

SYMBOL	NAME
MpA	Milford silty clay loam, 0 to 2 percent slopes
MrA	Milford silty clay loam, gravelly substratum, 0 to 2 percent slopes
MsA	Millsdale silt loam, 0 to 2 percent slopes
MtA	Millsdale silty clay loam, 0 to 2 percent slopes
MuA	Milton silt loam, 0 to 2 percent slopes
MuB	Milton silt loam, 2 to 6 percent slopes
MuB2	Milton silt loam, 2 to 6 percent slopes, eroded
MuC2	Milton silt loam, 6 to 12 percent slopes, eroded
MuD2	Milton silt loam, 12 to 18 percent slopes, eroded
MuE2	Milton silt loam, 18 to 25 percent slopes, eroded
MwA	Morningsun silt loam, 0 to 2 percent slopes
MxA	Morningsun-Xenia silt loams, 0 to 2 percent slopes
MxB	Morningsun-Xenia silt loams, 2 to 6 percent slopes
MxB2	Morningsun-Xenia silt loams, 2 to 6 percent slopes, eroded
MyA	Mahalasville silt loam, 0 to 2 percent slopes
OcA	Ockley silt loam, 0 to 2 percent slopes
OcB	Ockley silt loam, 2 to 6 percent slopes
Pg	Pits, gravel
Pq	Pits, quarry
PtB	Plattville silt loam, moderately wet, 2 to 6 percent slopes
RaA	Rainsville silt loam, 0 to 2 percent slopes
RaB	Rainsville silt loam, 2 to 6 percent slopes
RaB2	Rainsville silt loam, 2 to 6 percent slopes, eroded
RcA	Randolph silt loam, 0 to 2 percent slopes
RcB	Randolph silt loam, 2 to 6 percent slopes
RnE2	Rodman gravelly loam, 18 to 25 percent slopes, eroded
RnF2	Rodman gravelly loam, 25 to 50 percent slopes, eroded
RoE2	Rodman-Kendallville complex, 18 to 25 percent slopes, eroded
RoF2	Rodman-Kendallville complex, 25 to 50 percent slopes, eroded
RpA	Rossburg silt loam, moderately wet, sandy substratum, 0 to 1 percent slopes, occasionally flooded
RuB	Russell-Miamian silt loams, 2 to 6 percent slopes
RuB2	Russell-Miamian silt loams, 2 to 6 percent slopes, eroded
SeA	Savona silt loam, 0 to 2 percent slopes
SnA	Sloan silt loam, sandy substratum, 0 to 1 percent slopes, frequently flooded
StA	Stonelick loam, gravelly substratum, 0 to 1 percent slopes, frequently flooded
SvA	Sugarvalley silt loam, 0 to 2 percent slopes
SwA	Sugarvalley-Fincastle silt loams, 0 to 2 percent slopes
ThA	Thackery silt loam, 0 to 2 percent slopes
ThB	Thackery silt loam, 2 to 6 percent slopes
Ud	Udorthents
W	Water
WbA	Warsaw loam, 0 to 2 percent slopes
WnA	Westland silt loam, 0 to 2 percent slopes
WyB	Wynn silt loam, 2 to 6 percent slopes
WyB2	Wynn silt loam, 2 to 6 percent slopes, eroded
WyC2	Wynn silt loam, 6 to 12 percent slopes, eroded
WyD2	Wynn silt loam, 12 to 18 percent slopes, eroded
XeA	Xenia silt loam, 0 to 2 percent slopes
XeB	Xenia silt loam, 2 to 6 percent slopes
XeB2	Xenia silt loam, 2 to 6 percent slopes, eroded
XfB	Xenia silt loam, bedrock substratum, 2 to 6 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES
- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access area
- Field sheet matchline & neatline
- Previously Published Survey

OTHER BOUNDARY (label)
- Airport, airfield
- Cemetary
- City/county park

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER (section and land grants)

GEOGRAPHIC COORDINATE TICK

TRANSPORTATION
- Divided roads
- Other roads
- Trail

ROAD EMBLEM AND DESIGNATIONS
- Interstate — 173 — 79 345
- Federal — 287 — 410 224
- State — 52 — 52 347
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE

PIPELINE

FENCE

LEVEES
- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

DAMS
- Medium or Small — W

LANDFORM FEATURES
- Prominent hill or peak
- Soil Sample Site — S

MISCELLANEOUS CULTURAL FEATURES
- Farmstead, house
- Church
- School
- Other Religion — Mt Carmel
- Located object — Ranger Station
- Tank — Petroleum
- Lookout Tower
- Oil and/or Natural Gas Wells
- Windmill
- Lighthouse

HYDROGRAPHIC FEATURES

STREAMS
- Perennial stream, double line
- Perennial stream, single line
- Intermittent stream
- Drainage end

DRAINAGE AND IRRIGATION
- Double-line canal (label) — CANAL
- Perennial drainage and/or irrigation ditch
- Intermittent drainage and/or irrigation ditch

SMALL LAKES, PONDS AND RESERVOIRS
- Perennial water
- Miscellaneous water
- Flood pool line — FLOOD POOL LINE

MISCELLANEOUS WATER FEATURES
- Spring
- Well, artesian
- Well, irrigation

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS — CeA EgA

LANDFORM FEATURES
- Bedrock escarpments
- Other than bedrock escarpments
- Short steep slope
- Gully
- Depression, closed
- Sinkhole

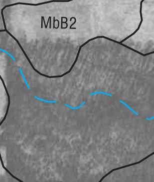
EXCAVATIONS
- Borrow pits
- Gravel pit
- Mine or quarry
- Landfill

MISCELLANEOUS SURFACE FEATURES
- Blowout
- Clay spot
- Gravelly spot
- Muck spot
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Typical pedon
- Very stony spot
- Wet spot

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

INDEX TO ADJOINING 3.75 MAPS

1 WHITEWATER SE
2 NEW MADISON SW
7 NEW PARIS NE
7 NEW PARIS NE
8 EATON NORTH NW

WHITEWATER SE, (OVERSIZED) OHIO

3.75 MINUTE SERIES
SHEET NUMBER 1 OF 36

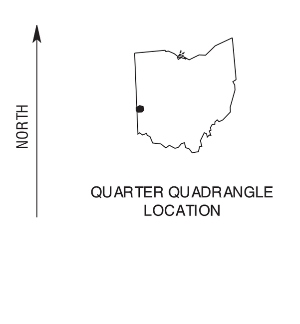
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

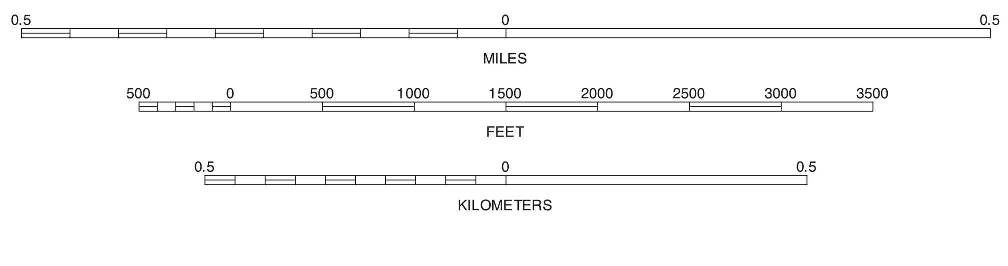
PREBLE COUNTY, OHIO
NEW MADISON SW QUADRANGLE
SHEET NUMBER 2 OF 36

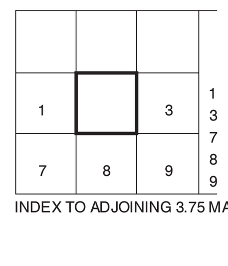
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000





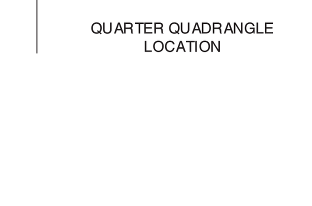
1 WHITEWATER SE
3 NEW MADISON SE
7 NEW PARIS NE
8 EATON NORTH NW
9 EATON NORTH NE

NEW MADISON SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 2 OF 36

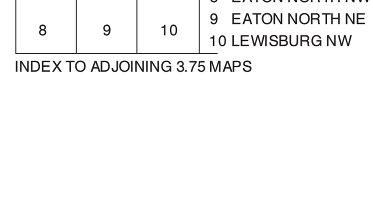
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



NEW MADISON SE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 3 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

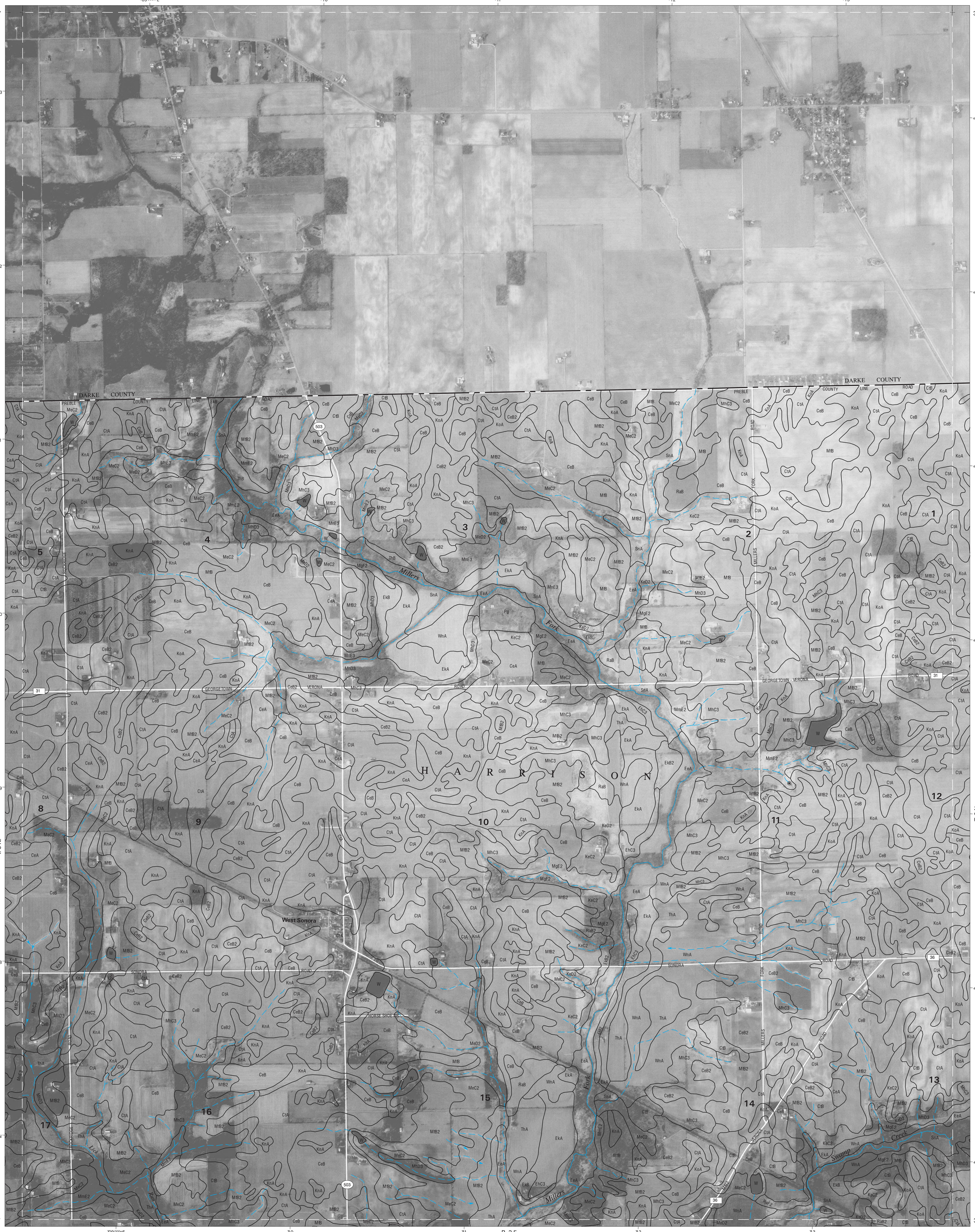
3 NEW MADISON SE
5 ARCANUM SE
9 EATON NORTH NE
10 LEWISBURG NW
11 LEWISBURG NE
INDEX TO ADJOINING 3.75 MAPS

ARCANUM SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 4 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
ARCANUM SE QUADRANGLE
SHEET NUMBER 5 OF 36



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 0 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

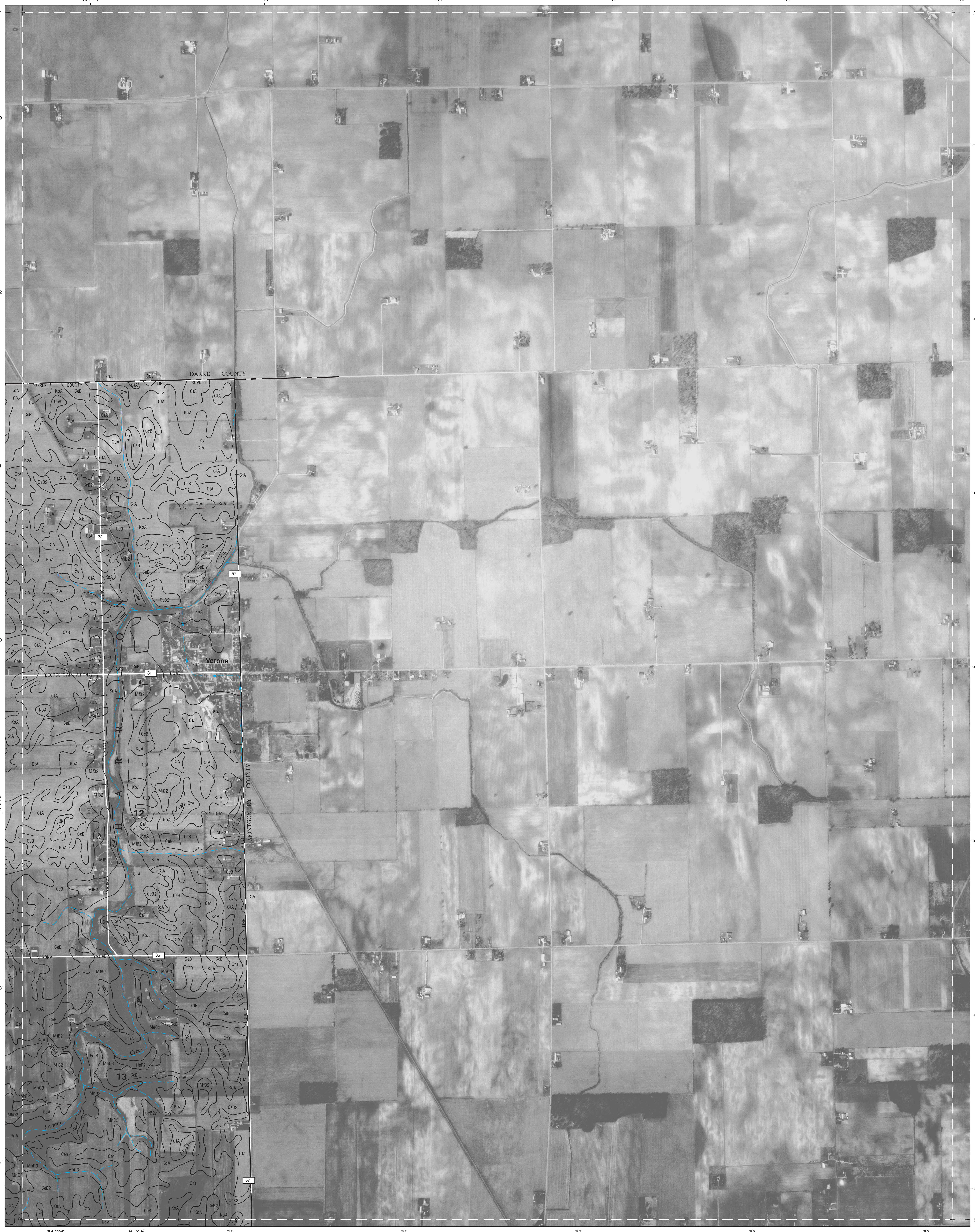
KILOMETERS: 0.5 0 0.5

4 ARCANUM SW
6 LAURA SW
10 LEWISBURG NW
11 LEWISBURG NE
12 BROOKVILLE NW

INDEX TO ADJOINING 3.75 MAPS

ARCANUM SE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 5 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

5		
11	12	

5 ARCANUM SE
11 LEWISBURG NE
12 BROOKVILLE NW

INDEX TO ADJOINING 3.75 MAPS

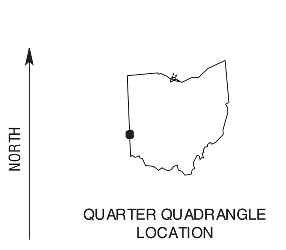
LAURA SW, OHIO

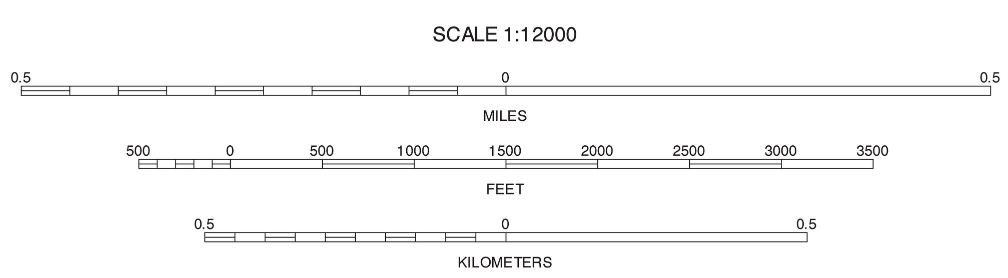
3.75 MINUTE SERIES
SHEET NUMBER 6 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





1	1	2
7		8
13	13	14

1 WHITEWATER SE
1 WHITEWATER SE
2 NEW MADISON SW
7 NEW PARIS NE
8 EATON NORTH NW
13 NEW PARIS SE
13 NEW PARIS SE
14 EATON NORTH SW

INDEX TO ADJOINING 3.75 MAPS

NEW PARIS NE, (OVERSIZED) OHIO

3.75 MINUTE SERIES
SHEET NUMBER 7 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
EATON NORTH NW QUADRANGLE
SHEET NUMBER 8 OF 36

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

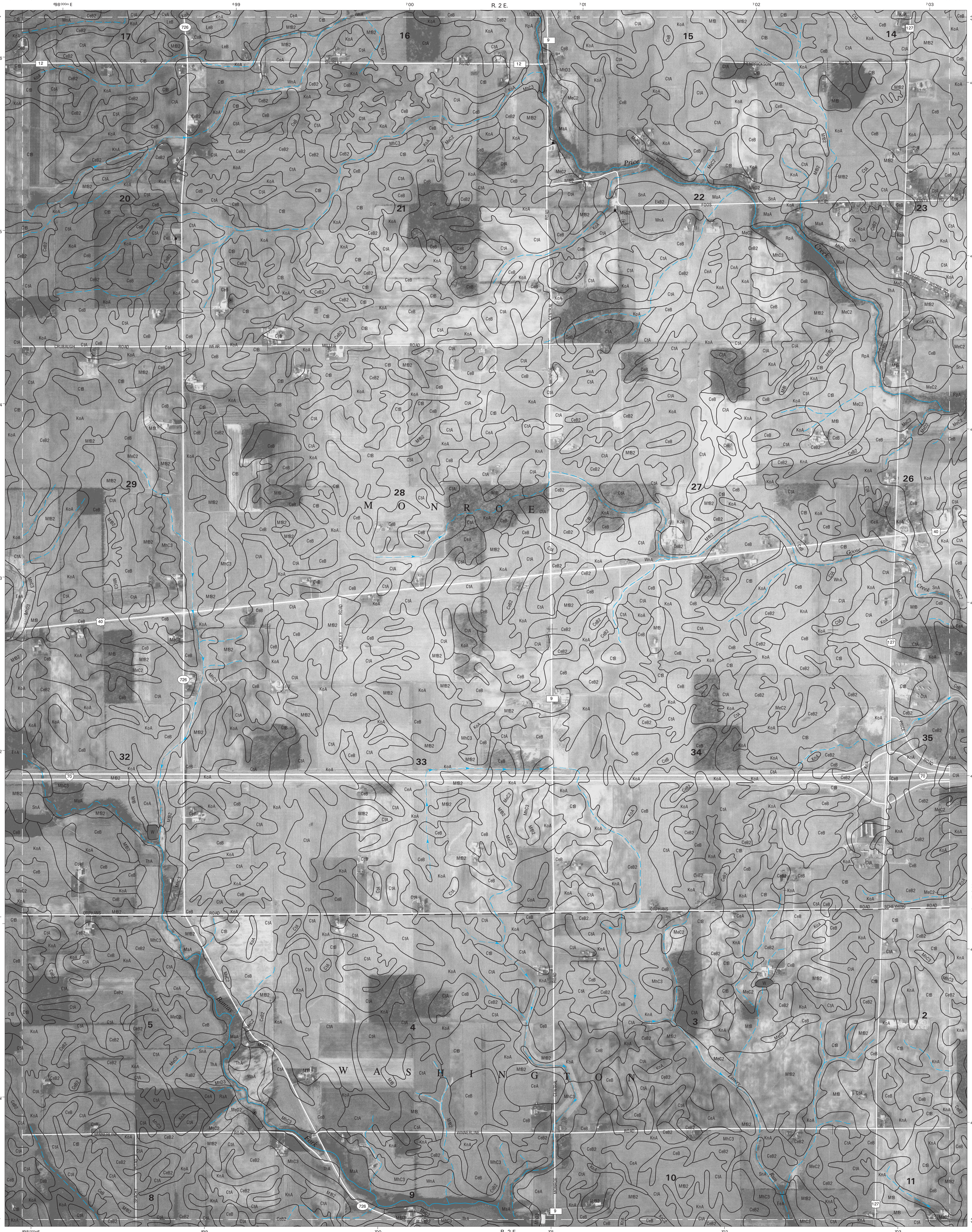
1	2	3
7		9
13	14	15

1 WHITEWATER SE
2 NEW MADISON SW
3 NEW MADISON SE
7 NEW PARIS NE
9 EATON NORTH NE
13 NEW PARIS SE
14 EATON NORTH SW
15 EATON NORTH SE

INDEX TO ADJOINING 3.75 MAPS

EATON NORTH NW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 8 OF 36

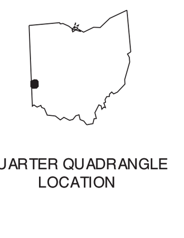
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

2	3	4
8		10
14	15	16

2 NEW MADISON SW
3 NEW MADISON SE
4 ARCANUM SW
8 EATON NORTH NW
10 LEWISBURG NW
14 EATON NORTH SW
15 EATON NORTH SE
16 LEWISBURG SW

INDEX TO ADJOINING 3.75 MAPS

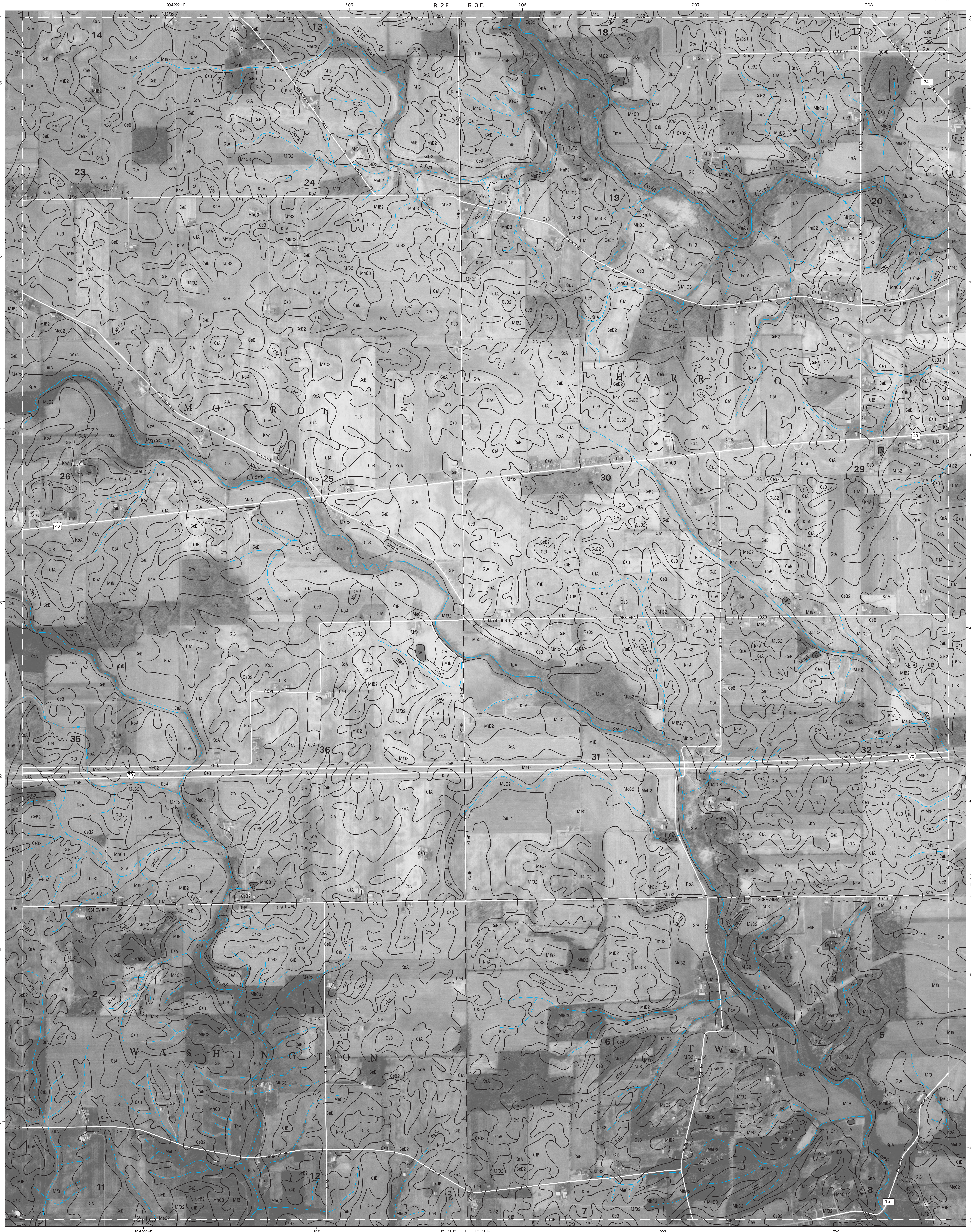
EATON NORTH NE, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 9 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

84° 37′30″ | 84° 33′45″

39° 52′30″ | 39° 52′30″



39° 48′45″ | 39° 48′45″

84° 37′30″ | 84° 33′45″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 — 0 — 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS: 0.5 — 0 — 0.5

3	4	5
9		11
15	16	17

3 NEW MADISON SE
4 ARCANUM SW
5 ARCANUM SE
9 EATON NORTH NE
11 LEWISBURG NE
15 EATON NORTH SE
16 LEWISBURG SW
17 LEWISBURG SE

INDEX TO ADJOINING 3.75 MAPS

LEWISBURG NW, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 10 OF 36

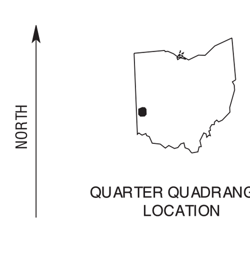
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

84° 33′45″ — 84° 30′00″
39° 52′30″

39° 48′45″
84° 33′45″ — 709 000mE — 710 — 711 — R. 3 E. — 712 — 713 — 714 — 84° 30′00″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 — 0 — 0.5
MILES

500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500
FEET

0.5 — 0 — 0.5
KILOMETERS

4	5	6
10		12
16	17	18

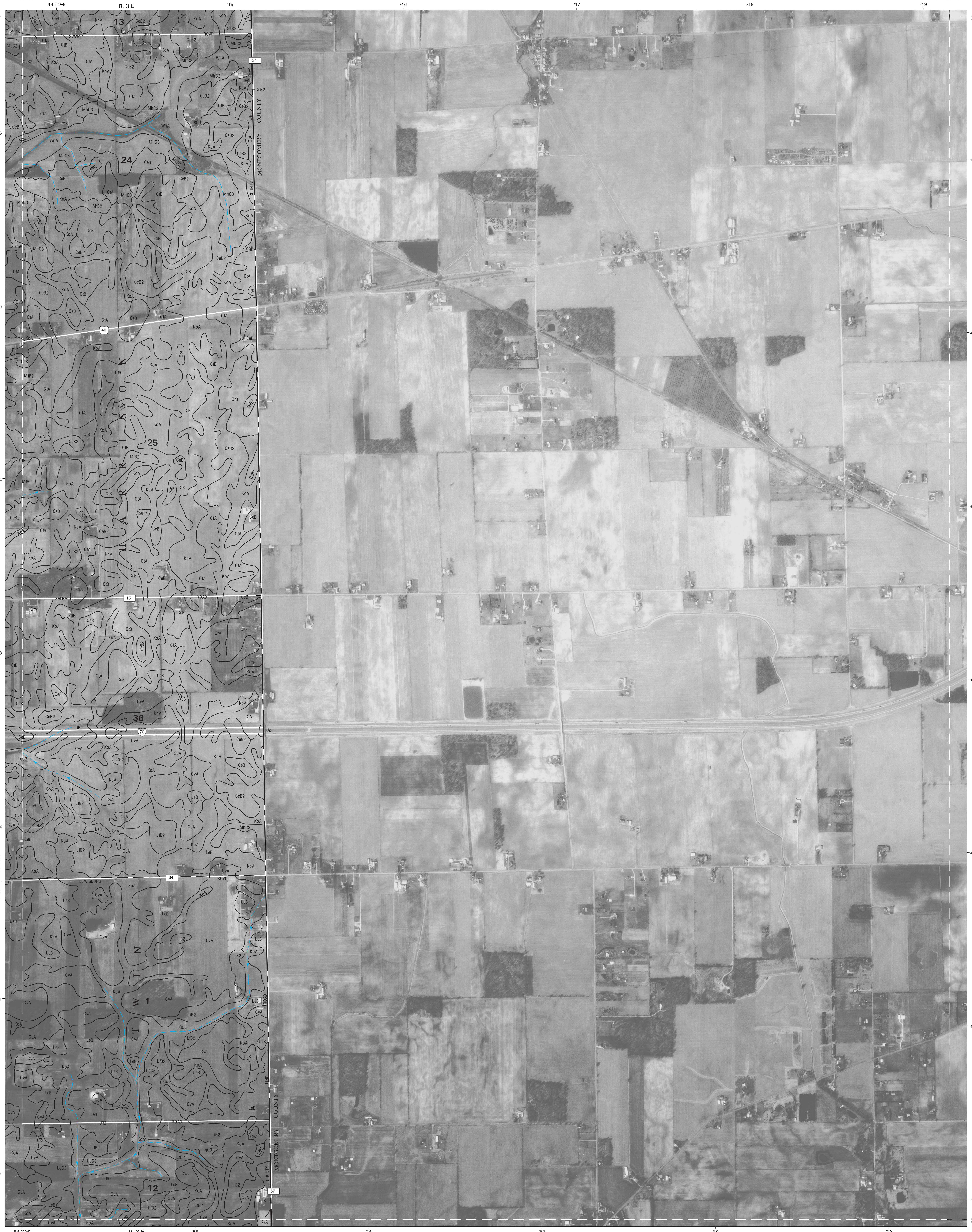
4 ARCANUM SW
5 ARCANUM SE
6 LAURA SW
10 LEWISBURG NW
12 BROOKVILLE NW
16 LEWISBURG SW
17 LEWISBURG SE
18 BROOKVILLE SW

INDEX TO ADJOINING 3.75 MAPS

LEWISBURG NE, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 11 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES
0.5 — 0 — 0.5

FEET
500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500

KILOMETERS
0.5 — 0 — 0.5

5	6	
11	■	
17	18	

5 ARCANUM SE
6 LAURA SW
11 LEWISBURG NE
17 LEWISBURG SE
18 BROOKVILLE SW

INDEX TO ADJOINING 3.75 MAPS

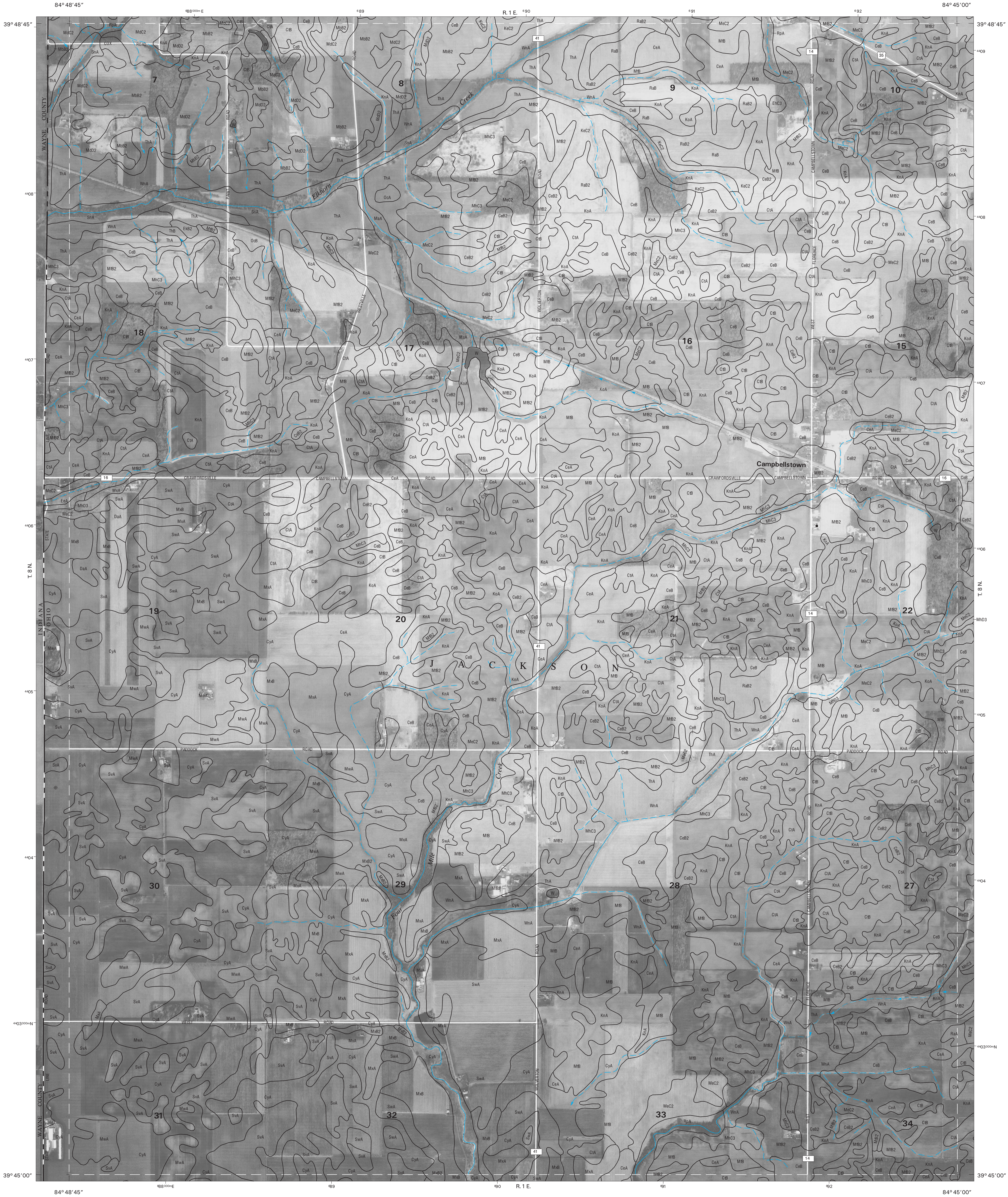
BROOKVILLE NW, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 12 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

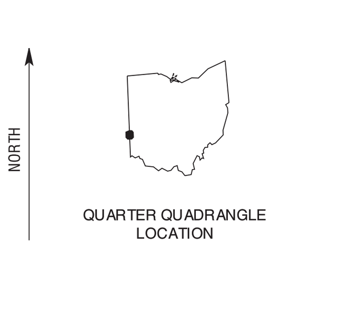
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
NEW PARIS SE QUADRANGLE (OVERSIZED)
SHEET NUMBER 13 OF 36



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

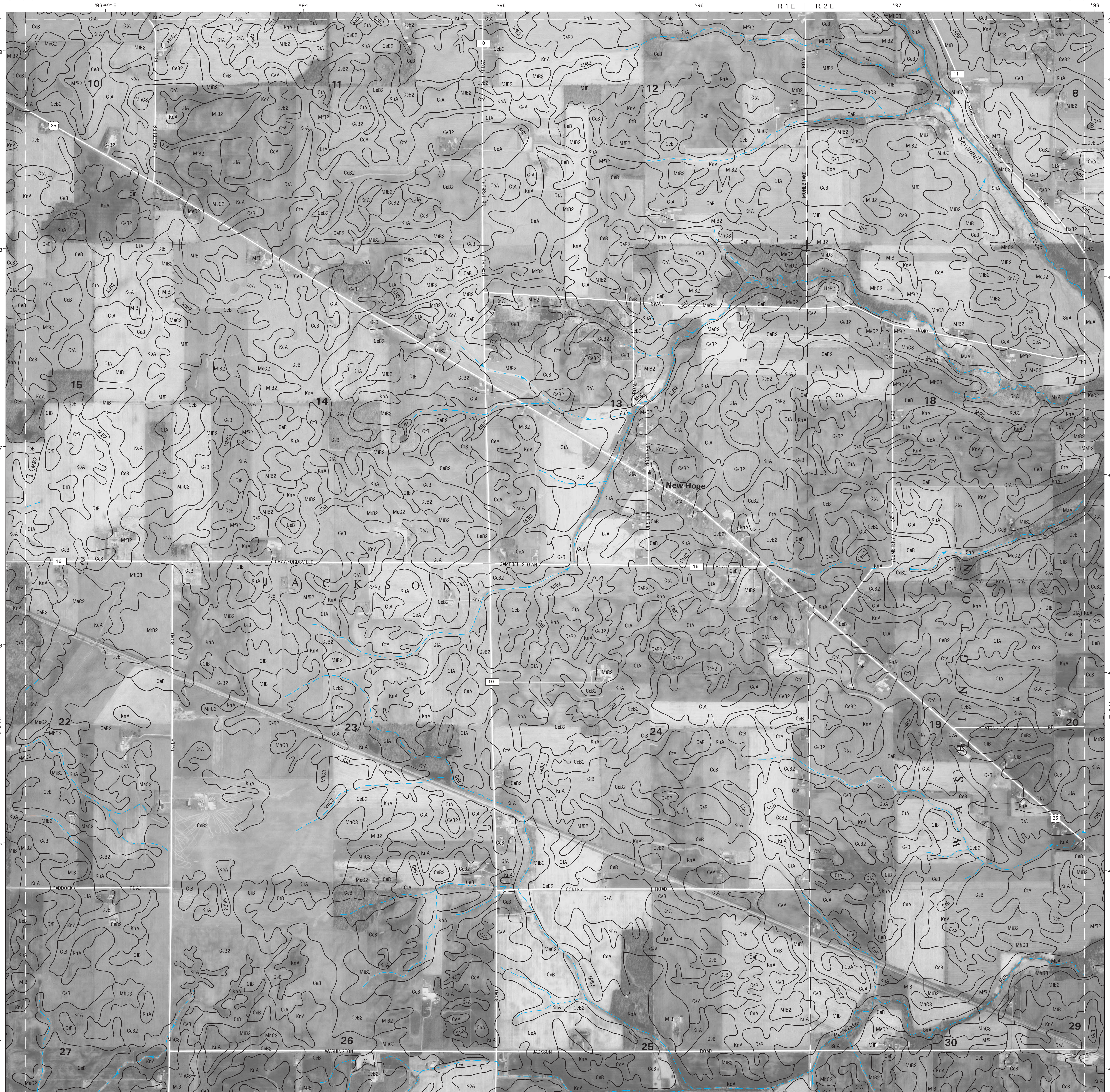
7 NEW PARIS NE
8 EATON NORTH NW
14 EATON NORTH SW
19 FAIRHAVEN NE
20 EATON SOUTH NW

INDEX TO ADJOINING 3.75 MAPS

NEW PARIS SE, (OVERSIZED) OHIO
3.75 MINUTE SERIES
SHEET NUMBER 13 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE
LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

7	8	9
13		15
19	20	21

7 NEW PARIS NE
8 EATON NORTH NW
9 EATON NORTH NE
13 NEW PARIS SE
15 EATON NORTH SE
19 FAIRHAVEN NE
20 EATON SOUTH NW
21 EATON SOUTH NE

INDEX TO ADJOINING 3.75 MAPS

EATON NORTH SW, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 14 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

84° 41′15″ | R. 2 E. | 84° 37′30″

39° 48′45″

39° 45′00″

84° 41′15″ | R. 2 E. | 84° 37′30″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

8	9	10
14		16
20	21	22

8 EATON NORTH NW
9 EATON NORTH NE
10 LEWISBURG NW
14 EATON NORTH SW
16 LEWISBURG SW
20 EATON SOUTH NW
21 EATON SOUTH NE
22 WEST ALEXANDRIA NW

INDEX TO ADJOINING 3.75 MAPS

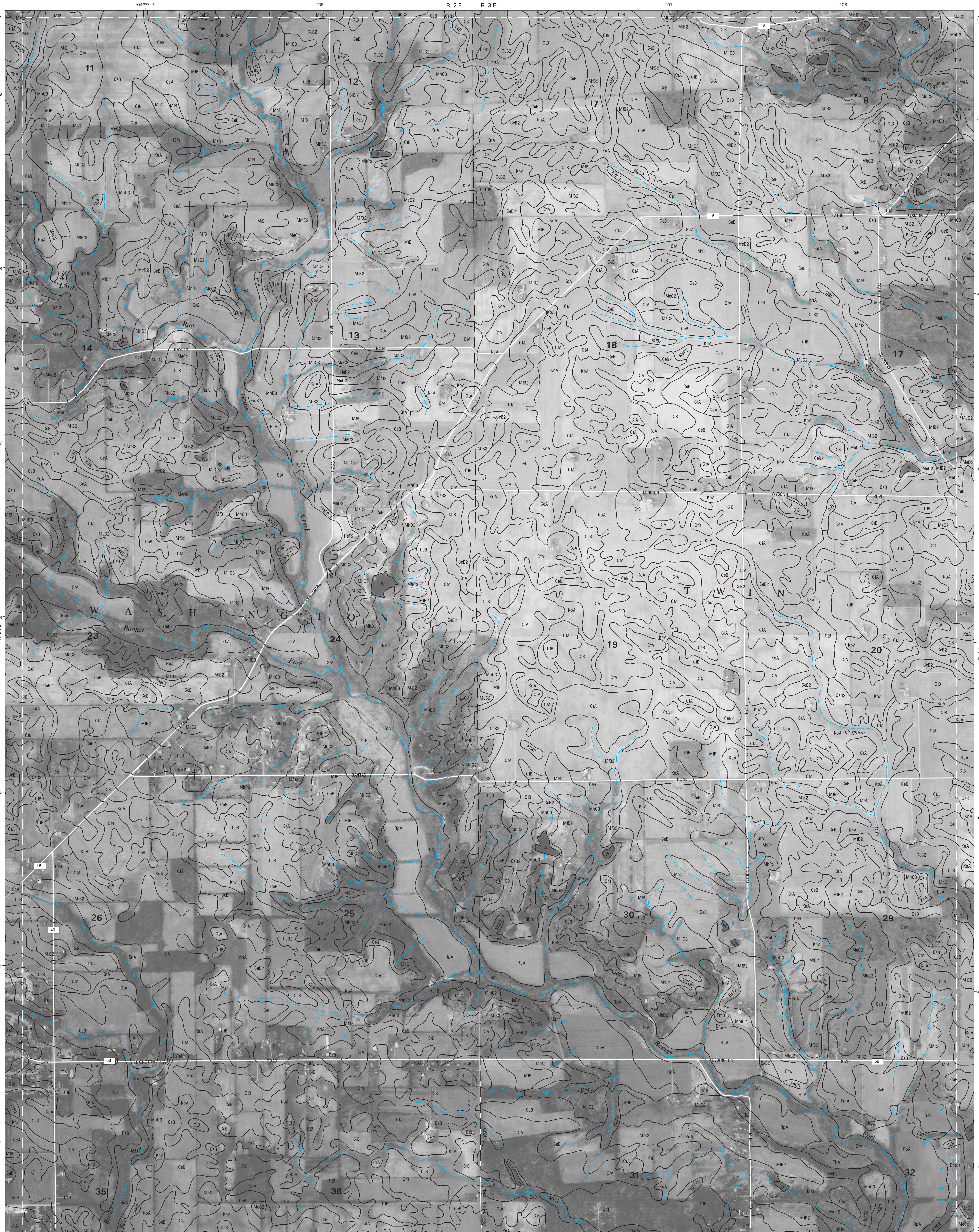
EATON NORTH SE, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 15 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
LEWISBURG SW QUADRANGLE
SHEET NUMBER 16 OF 36



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES | FEET | KILOMETERS

9	10	11
15		17
21	22	23

9 EATON NORTH NE
10 LEWISBURG NW
11 LEWISBURG NE
15 EATON NORTH SE
17 LEWISBURG SE
21 EATON SOUTH NE
22 WEST ALEXANDRIA NW
23 WEST ALEXANDRIA NE

INDEX TO ADJOINING 3.75 MAPS

LEWISBURG SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 16 OF 36

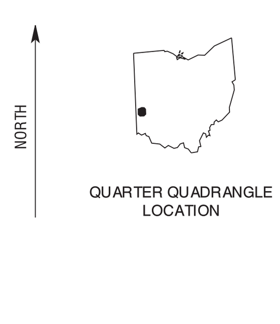
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
LEWISBURG SE QUADRANGLE
SHEET NUMBER 17 OF 36

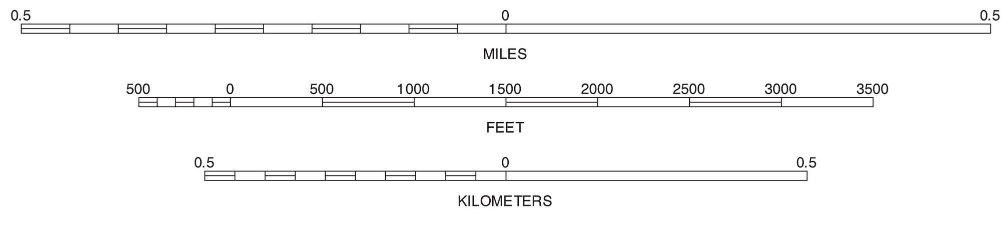
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE
LOCATION

SCALE 1:12000



10	11	12
16		18
22	23	24

10 LEWISBURG NW
11 LEWISBURG NE
12 BROOKVILLE NW
16 LEWISBURG SW
18 BROOKVILLE SW
22 WEST ALEXANDRIA NW
23 WEST ALEXANDRIA NE
24 FARMERSVILLE NW

INDEX TO ADJOINING 3.75 MAPS

LEWISBURG SE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 17 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 — 0 — 0.5

FEET: 500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500

KILOMETERS: 0.5 — 0 — 0.5

11	12	
17		
23	24	

11 LEWISBURG NE
12 BROOKVILLE NW
17 LEWISBURG SE
23 WEST ALEXANDRIA NE
24 FARMERSVILLE NW

INDEX TO ADJOINING 3.75 MAPS

BROOKVILLE SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 18 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
FAIRHAVEN NE QUADRANGLE (OVERSIZED)
SHEET NUMBER 19 OF 36

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 0 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS: 0.5 0 0.5

	13	14
		20
	25	26

13 NEW PARIS SE
14 EATON NORTH SW
20 EATON SOUTH NW
25 FAIRHAVEN SE
26 EATON SOUTH SW

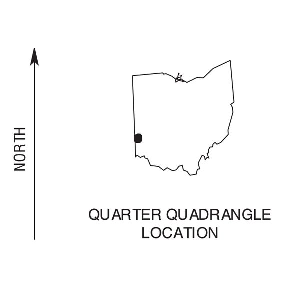
INDEX TO ADJOINING 3.75 MAPS

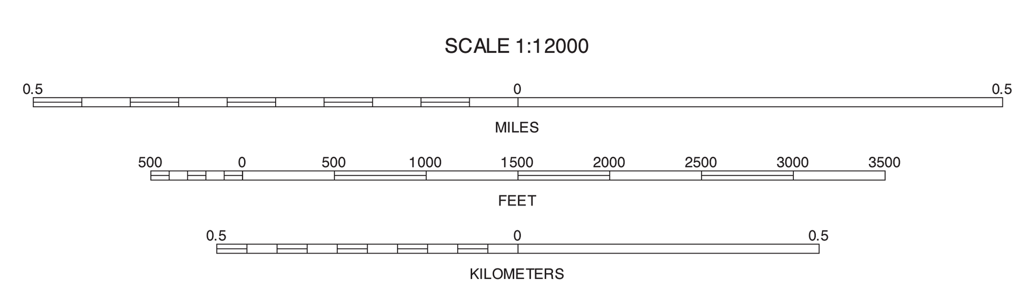
FAIRHAVEN NE, (OVERSIZED) OHIO
3.75 MINUTE SERIES
SHEET NUMBER 19 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





13	14	15
19		21
25	26	27

13 NEW PARIS SE
14 EATON NORTH SW
15 EATON NORTH SE
19 FAIRHAVEN NE
21 EATON SOUTH NE
25 FAIRHAVEN SE
26 EATON SOUTH SW
27 EATON SOUTH SE

INDEX TO ADJOINING 3.75 MAPS

EATON SOUTH NW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 20 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

14	15	16
20		22
26	27	28

14 EATON NORTH SW
15 EATON NORTH SE
16 LEWISBURG SW
20 EATON SOUTH NW
22 WEST ALEXANDRIA NW
26 EATON SOUTH SW
27 EATON SOUTH SE
28 WEST ALEXANDRIA SW

INDEX TO ADJOINING 3.75 MAPS

EATON SOUTH NE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 21 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
WEST ALEXANDRIA NW QUADRANGLE
SHEET NUMBER 22 OF 36

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

15	16	17
21		23
27	28	29

15 EATON NORTH SE
16 LEWISBURG SW
17 LEWISBURG SE
21 EATON SOUTH NE
23 WEST ALEXANDRIA NE
27 EATON SOUTH SE
28 WEST ALEXANDRIA SW
29 WEST ALEXANDRIA SE

INDEX TO ADJOINING 3.75 MAPS

WEST ALEXANDRIA NW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 22 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
WEST ALEXANDRIA NE QUADRANGLE
SHEET NUMBER 23 OF 36

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 — 0 — 0.5
MILES

500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500
FEET

0.5 — 0 — 0.5
KILOMETERS

16	17	18
22		24
28	29	30

16 LEWISBURG SW
17 LEWISBURG SE
18 BROOKVILLE SW
22 WEST ALEXANDRIA NW
24 FARMERSVILLE NW
28 WEST ALEXANDRIA SW
29 WEST ALEXANDRIA SE
30 FARMERSVILLE SW

INDEX TO ADJOINING 3.75 MAPS

WEST ALEXANDRIA NE, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 23 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

84° 30′00″ R. 3 E. 716 717 718 719 84° 26′15″

39° 45′00″

39° 41′15″

84° 30′00″ 715 000mE R. 3 E. 716 717 718 719 84° 26′15″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

17	18	
23		
29	30	

17 LEWISBURG SE
18 BROOKVILLE SW
23 WEST ALEXANDRIA NE
29 WEST ALEXANDRIA SE
30 FARMERSVILLE SW

INDEX TO ADJOINING 3.75 MAPS

FARMERSVILLE NW, OHIO

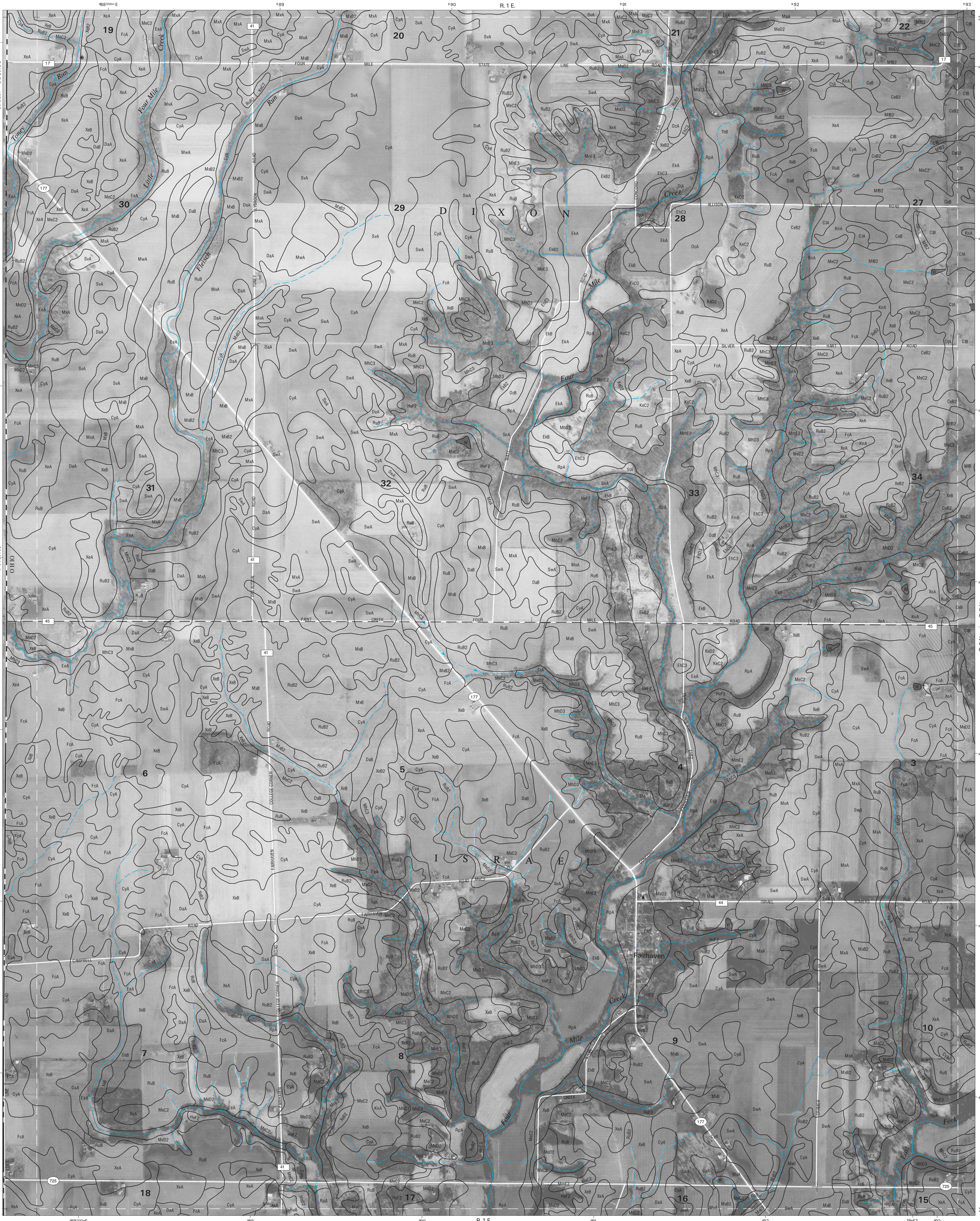
3.75 MINUTE SERIES
SHEET NUMBER 24 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
FAIRHAVEN SE QUADRANGLE (OVERSIZED)
SHEET NUMBER 25 OF 36

84° 48′ 45″ — 84° 45′ 00″
39° 41′ 15″ — 39° 37′ 30″



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

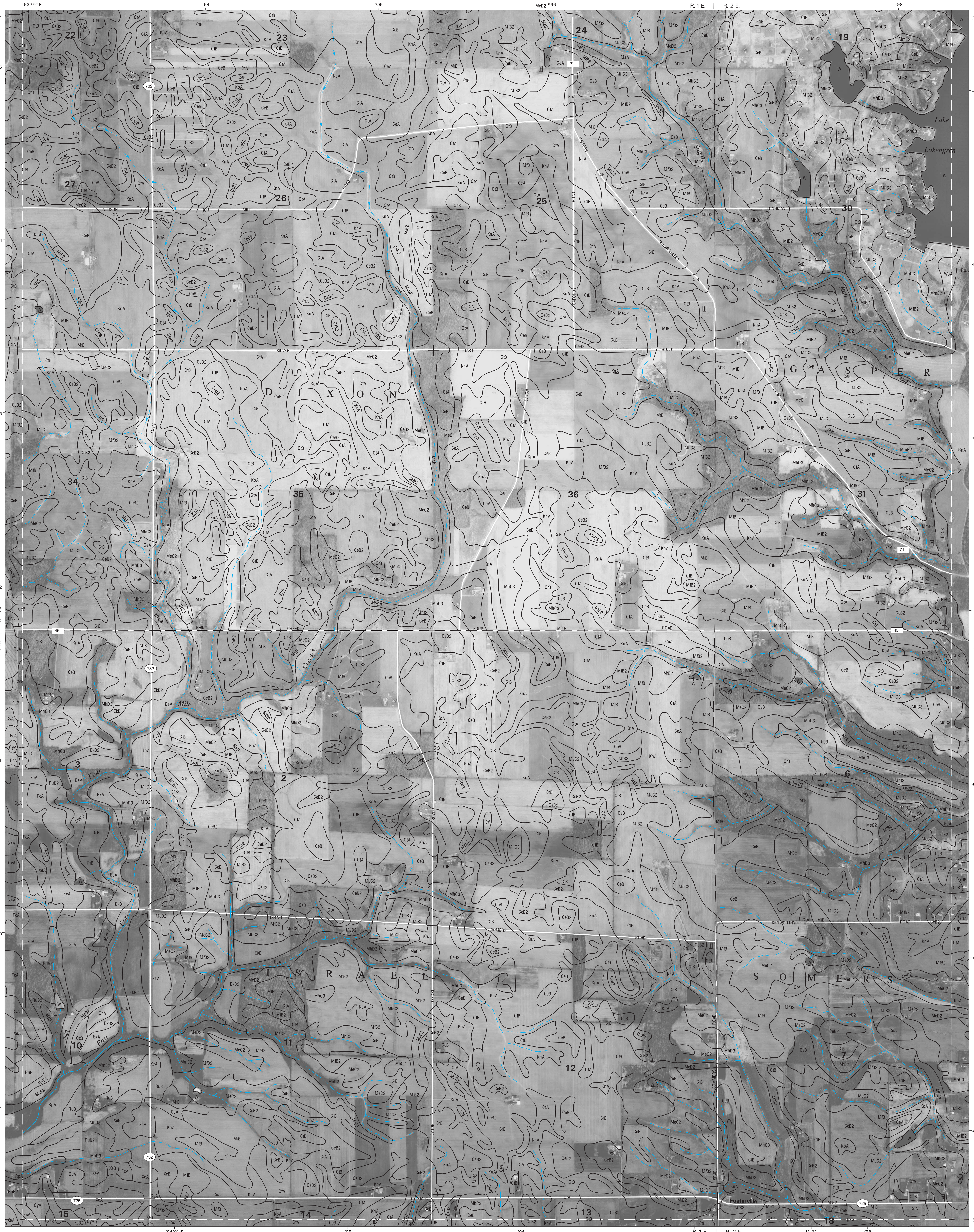
MILES: 0.5 0 0.5
FEET: 500 0 500 1000 1500 2000 2500 3000 3500
KILOMETERS: 0.5 0 0.5

INDEX TO ADJOINING 3.75 MAPS

19 FAIRHAVEN NE
20 EATON SOUTH NW
26 EATON SOUTH SW
31 COLLEGE CORNER NE
32 OXFORD NW

FAIRHAVEN SE, (OVERSIZED) OHIO
3.75 MINUTE SERIES
SHEET NUMBER 25 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

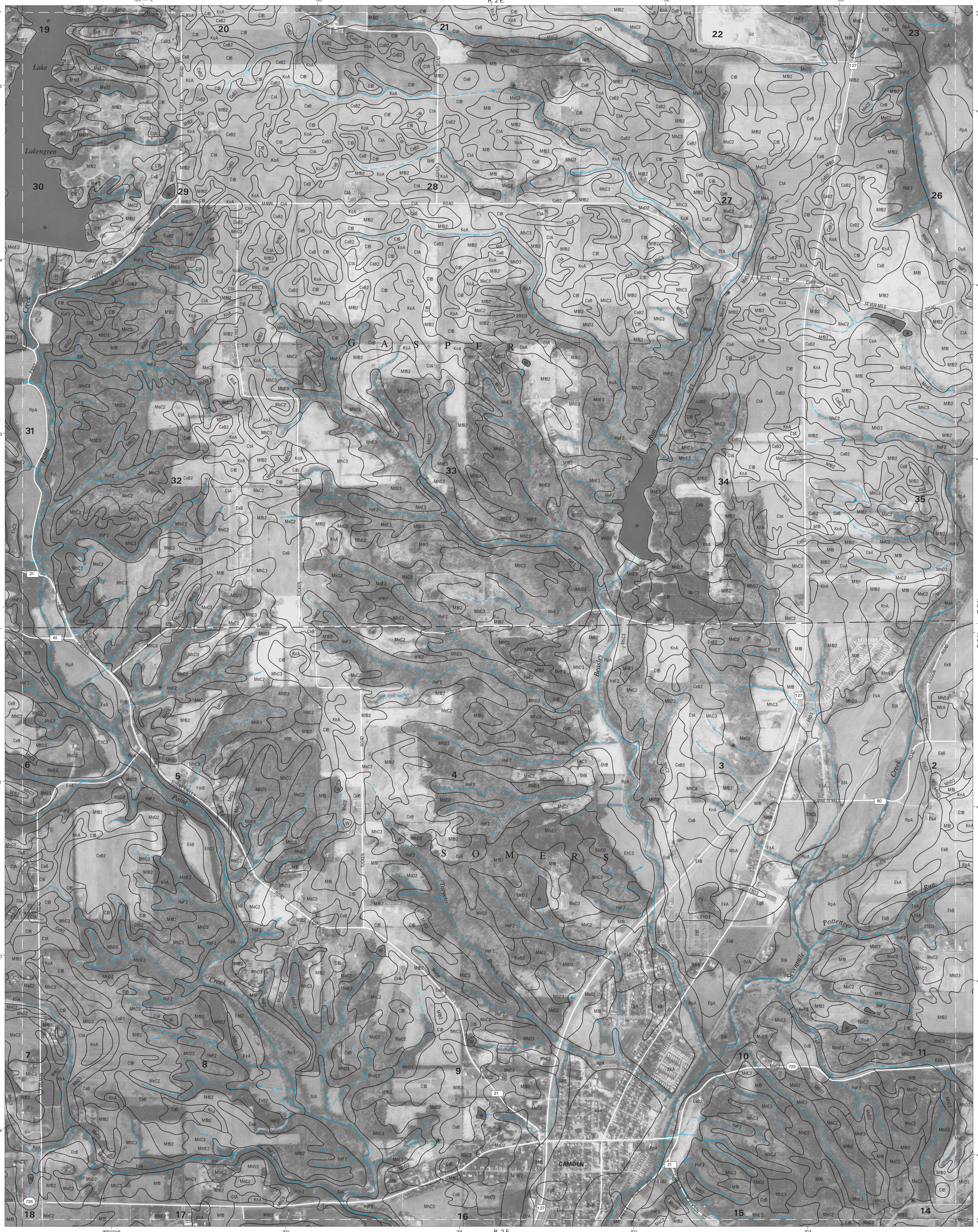
19	20	21
25		27
31	32	33

19 FAIRHAVEN NE
20 EATON SOUTH NW
21 EATON SOUTH NE
25 FAIRHAVEN SE
27 EATON SOUTH SE
31 COLLEGE CORNER NE
32 OXFORD NW
33 OXFORD NE

INDEX TO ADJOINING 3.75 MAPS

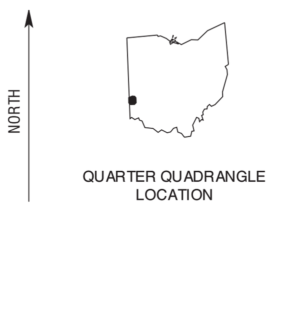
EATON SOUTH SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 26 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

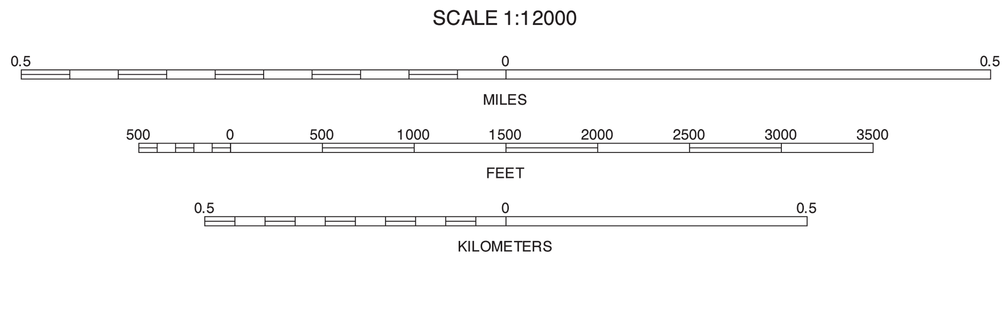


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



20	21	22
26		28
32	33	34

20 EATON SOUTH NW
21 EATON SOUTH NE
22 WEST ALEXANDRIA NW
26 EATON SOUTH SW
28 WEST ALEXANDRIA SW
32 OXFORD NW
33 OXFORD NE
34 WEST ELKTON NW

INDEX TO ADJOINING 3.75 MAPS

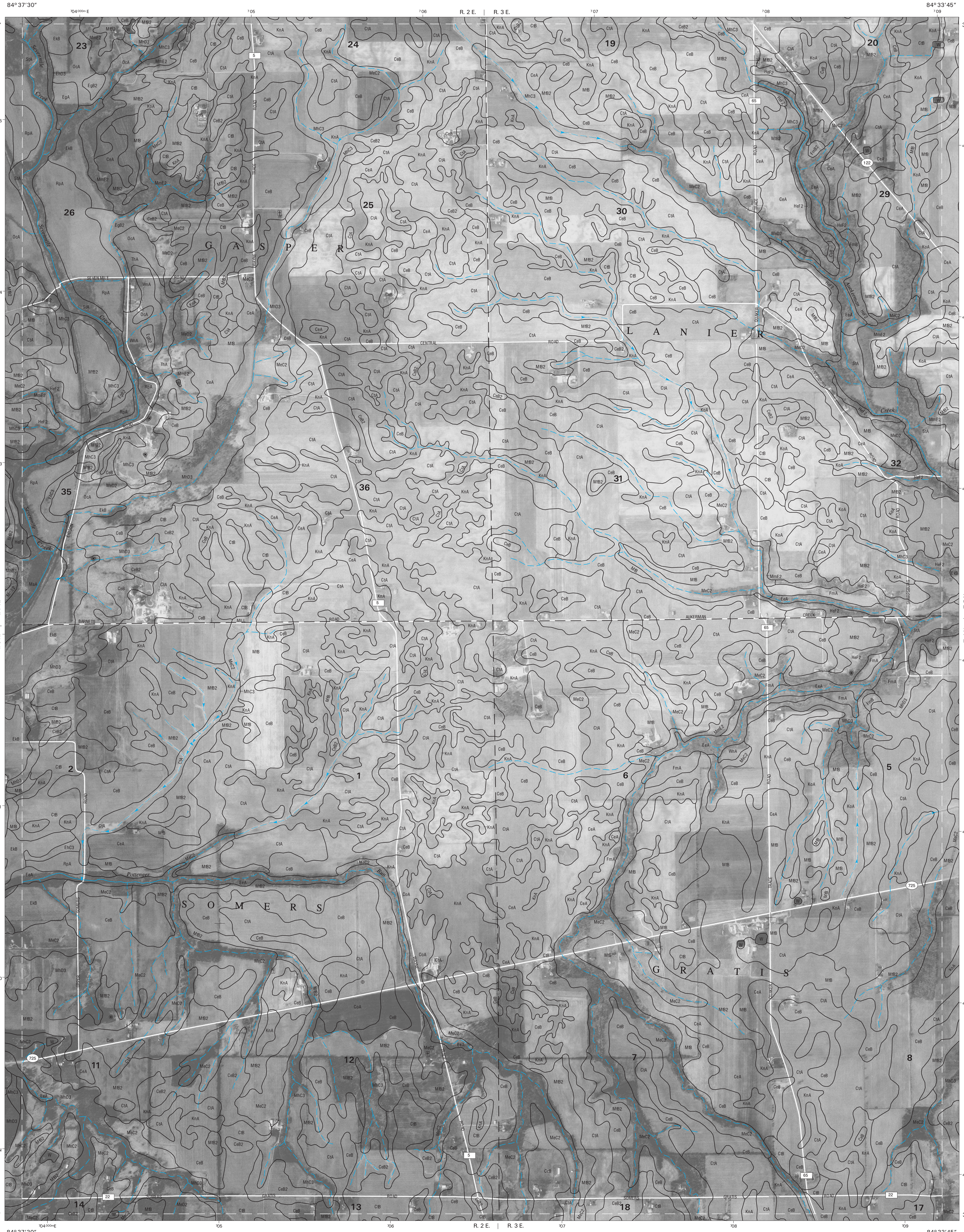
EATON SOUTH SE, OHIO

3.75 MINUTE SERIES
SHEET NUMBER 27 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
WEST ALEXANDRIA SW QUADRANGLE
SHEET NUMBER 28 OF 36



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 – 0 – 0.5

FEET: 500 – 0 – 500 – 1000 – 1500 – 2000 – 2500 – 3000 – 3500

KILOMETERS: 0.5 – 0 – 0.5

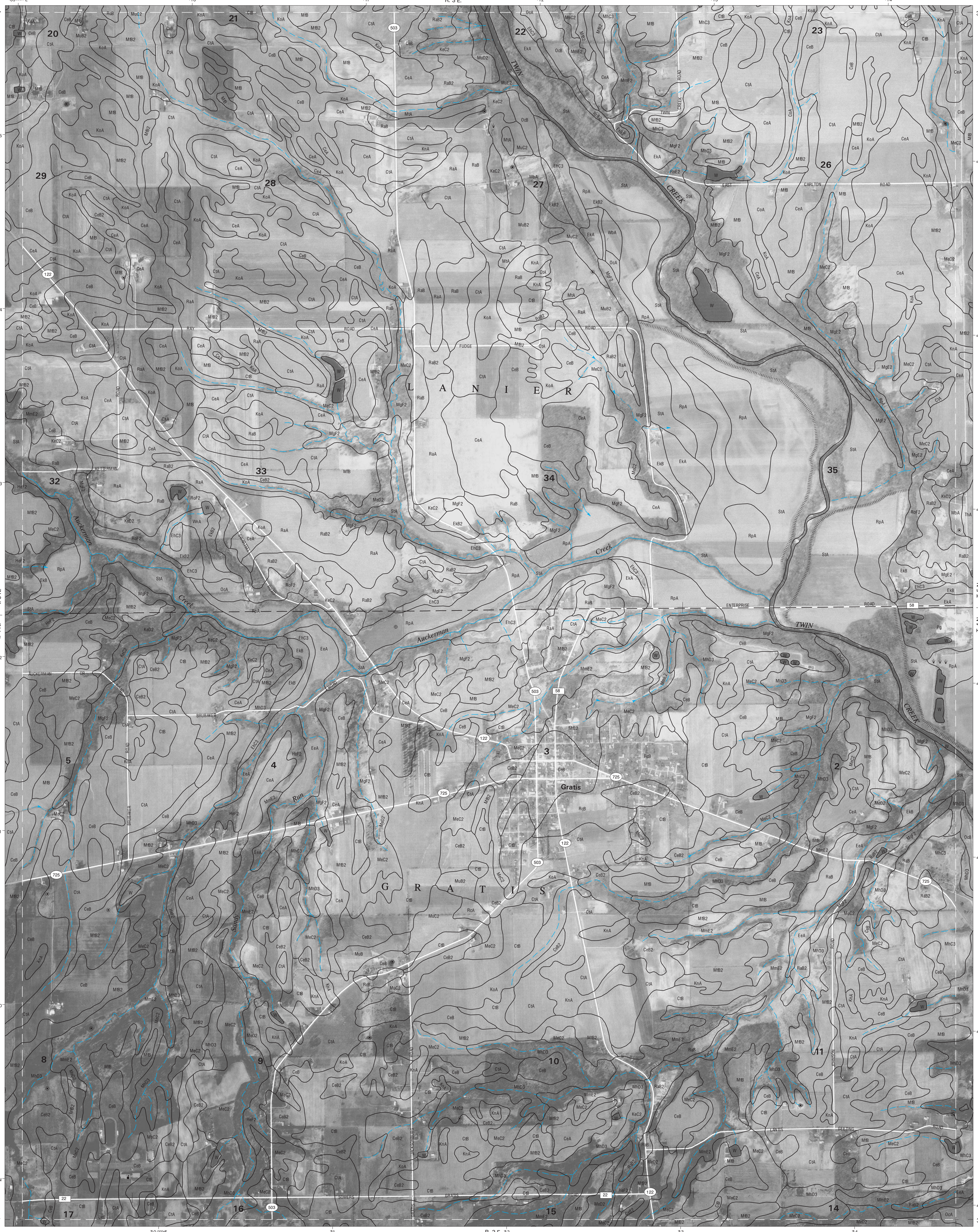
21	22	23
27		29
33	34	35

21 EATON SOUTH NE
22 WEST ALEXANDRIA NW
23 WEST ALEXANDRIA NE
27 EATON SOUTH SE
29 WEST ALEXANDRIA SE
33 OXFORD NE
34 WEST ELKTON NW
35 WEST ELKTON NE

INDEX TO ADJOINING 3.75 MAPS

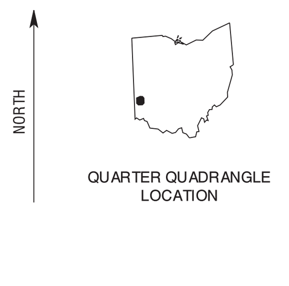
WEST ALEXANDRIA SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 28 OF 36

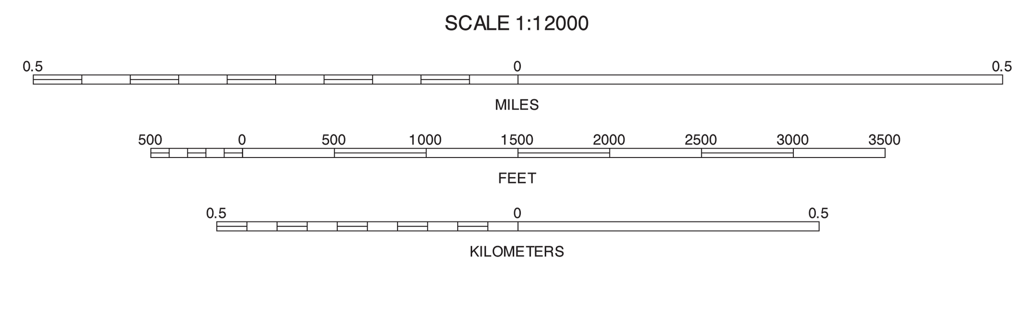
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





22	23	24
28		30
34	35	36

22 WEST ALEXANDRIA NW
23 WEST ALEXANDRIA NE
24 FARMERSVILLE NW
28 WEST ALEXANDRIA SW
30 FARMERSVILLE SW
34 WEST ELKTON NW
35 WEST ELKTON NE
36 MIDDLETOWN NW

INDEX TO ADJOINING 3.75 MAPS

WEST ALEXANDRIA SE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 29 OF 36

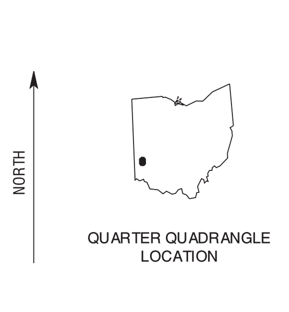
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

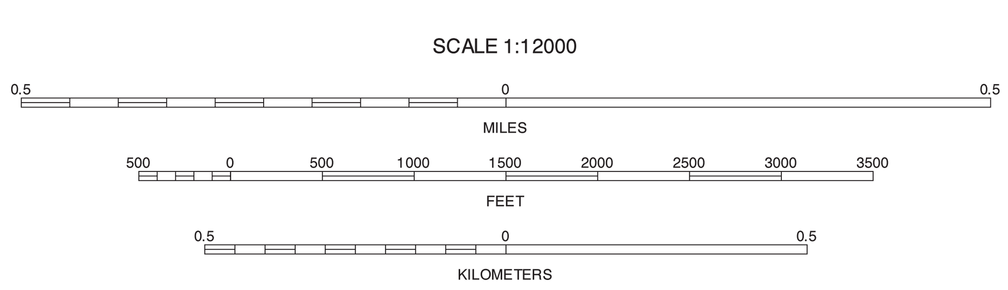
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PRESBLE COUNTY, OHIO
FARMERSVILLE SW QUADRANGLE
SHEET NUMBER 30 OF 36

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





23	24	
29		
35	36	

23 WEST ALEXANDRIA NE
24 FARMERSVILLE NW
29 WEST ALEXANDRIA SE
35 WEST ELKTON NE
36 MIDDLETOWN NW

INDEX TO ADJOINING 3.75 MAPS

FARMERSVILLE SW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 30 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
COLLEGE CORNER NE QUADRANGLE (OVERSIZED)
SHEET NUMBER 31 OF 36

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

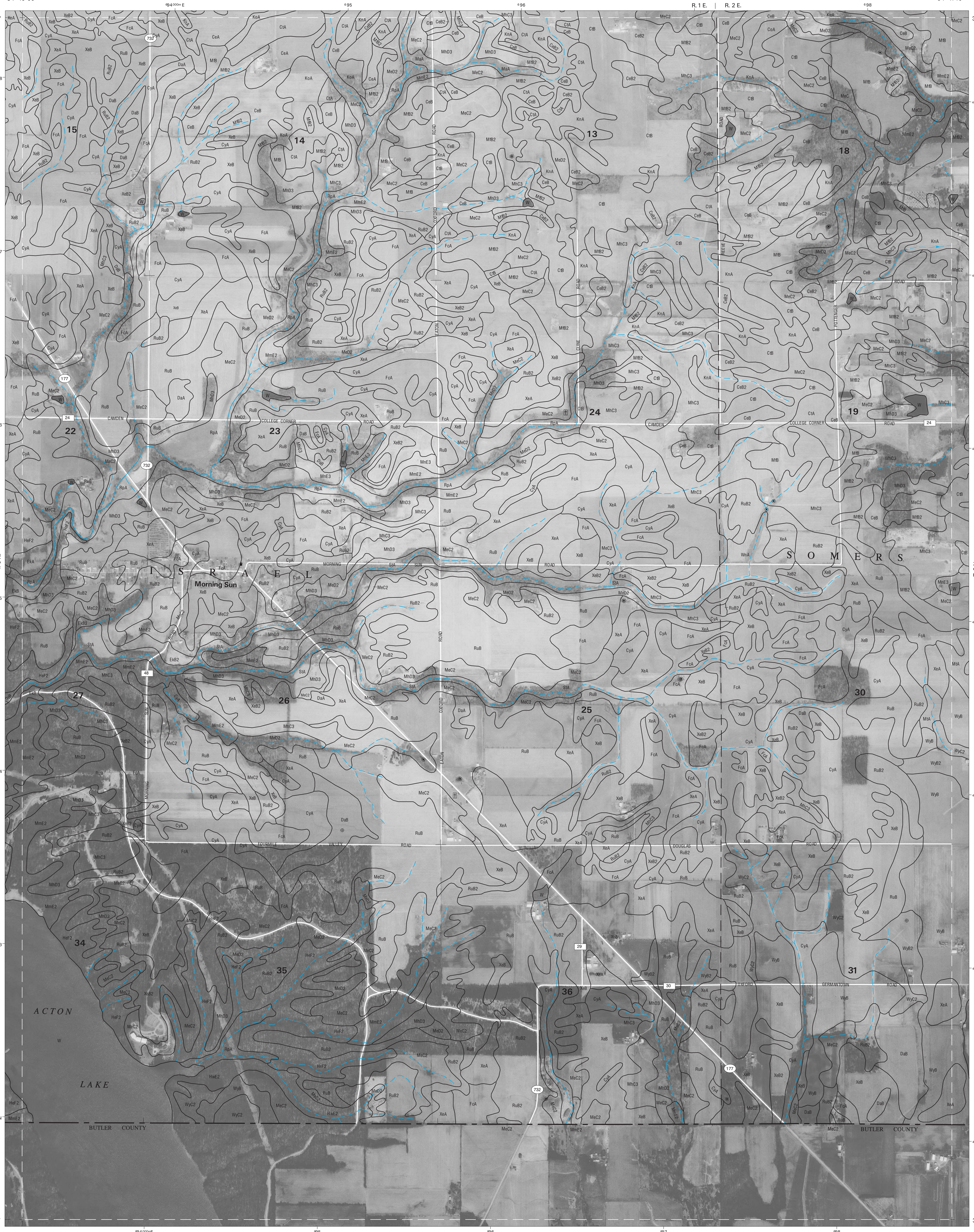
25	26
	32

25 FAIRHAVEN SE
26 EATON SOUTH SW
32 OXFORD NW

INDEX TO ADJOINING 3.75 MAPS

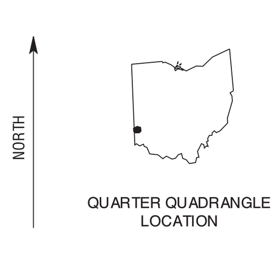
COLLEGE CORNER NE, (OVERSIZED) OHIO
3.75 MINUTE SERIES
SHEET NUMBER 31 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

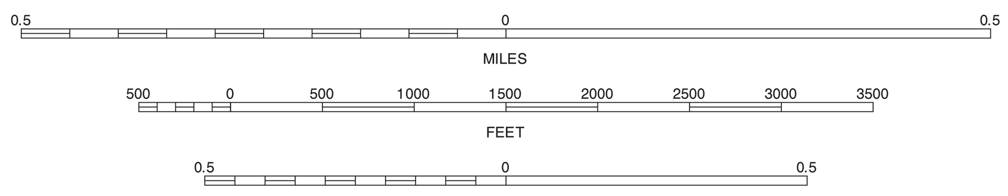


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



25	26	27
31		33

25 FAIRHAVEN SE
26 EATON SOUTH SW
27 EATON SOUTH SE
31 COLLEGE CORNER NE
33 OXFORD NE

INDEX TO ADJOINING 3.75 MAPS

OXFORD NW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 32 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
OXFORD NE QUADRANGLE
SHEET NUMBER 33 OF 36

84° 41′15″ | 84° 37′30″
39° 37′30″ | 39° 37′30″

39° 33′45″ | 39° 33′45″
84° 41′15″ | 84° 37′30″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

26	27	28
32		34

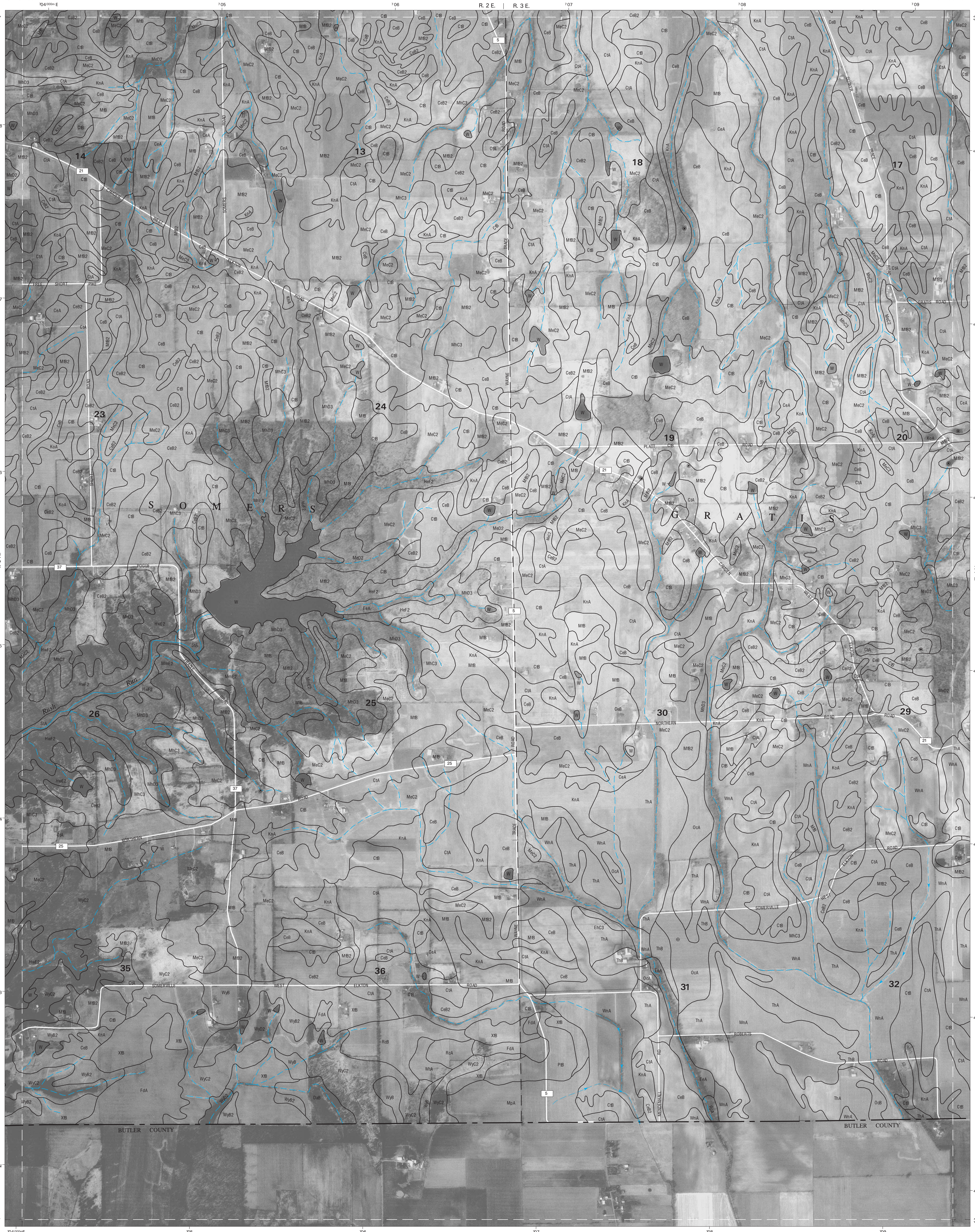
26 EATON SOUTH SW
27 EATON SOUTH SE
28 WEST ALEXANDRIA SW
32 OXFORD NW
34 WEST ELKTON NW

INDEX TO ADJOINING 3.75 MAPS

OXFORD NE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 33 OF 36

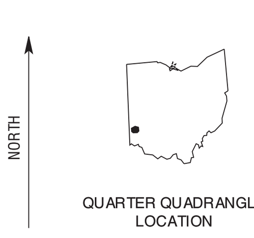
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

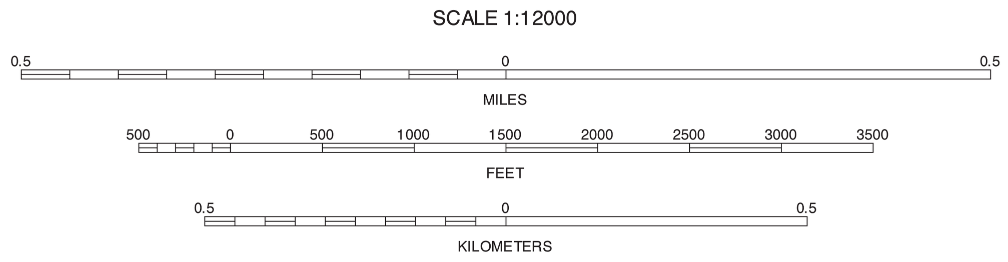


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



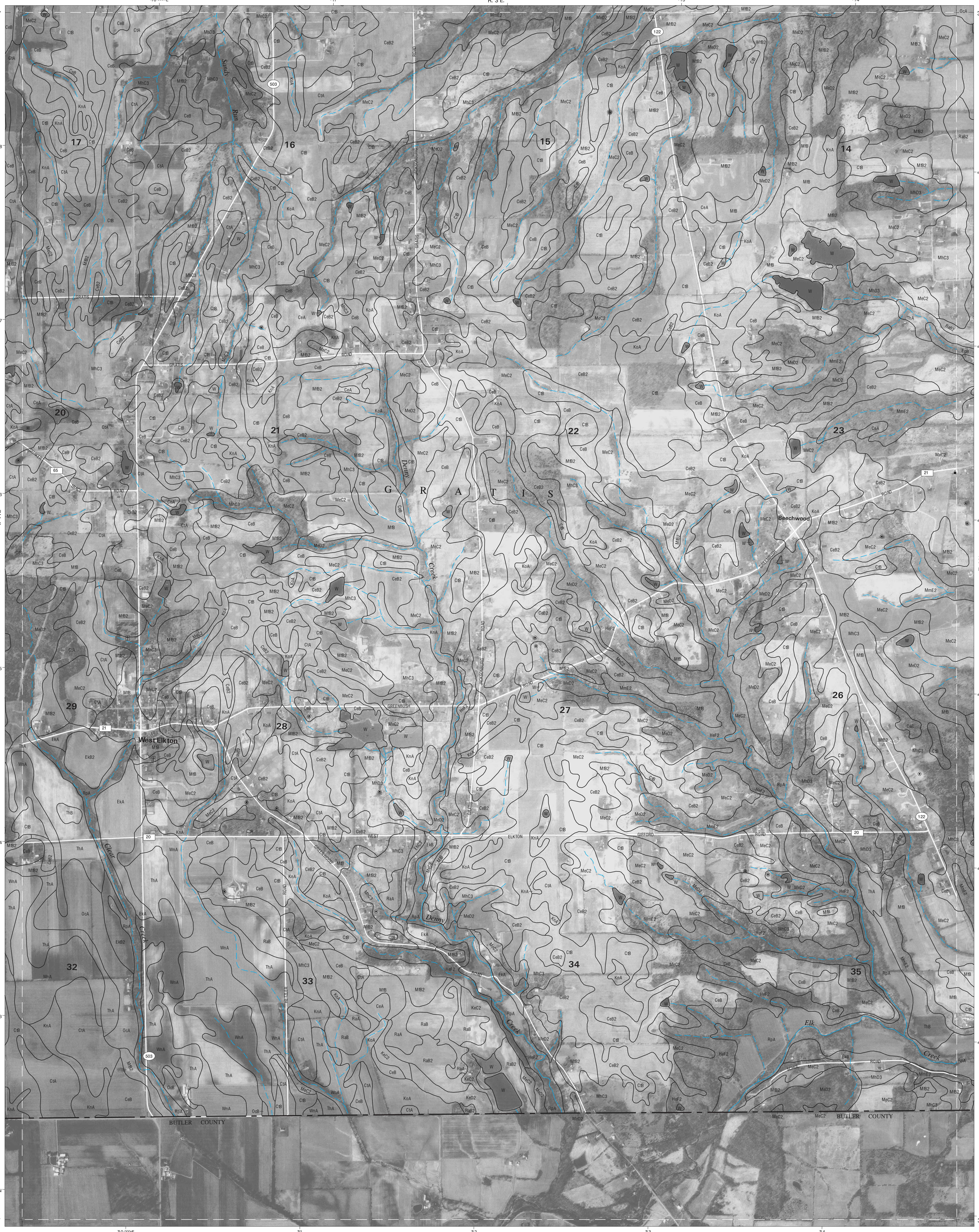
27	28	29
33		35

27 EATON SOUTH SE
28 WEST ALEXANDRIA SW
29 WEST ALEXANDRIA SE
33 OXFORD NE
35 WEST ELKTON NE

INDEX TO ADJOINING 3.75 MAPS

WEST ELKTON NW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 34 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

28	29	30
34		36

28 WEST ALEXANDRIA SW
29 WEST ALEXANDRIA SE
30 FARMERSVILLE SW
34 WEST ELKTON NW
36 MIDDLETOWN NW

INDEX TO ADJOINING 3.75 MAPS

WEST ELKTON NE, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 35 OF 36

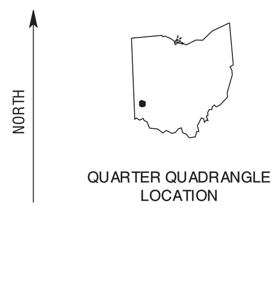
Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

PREBLE COUNTY, OHIO
MIDDLETOWN NW QUADRANGLE
SHEET NUMBER 36 OF 36

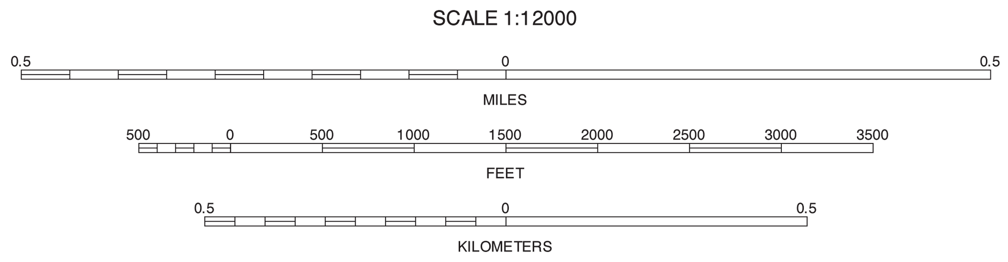
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1994 aerial photography. Hydrography information was acquired from the Department of Natural Resources. Cultural features were acquired from NRCS. The hydrography and cultural layers were edited to conform with features represented on the publication orthophotography and to enhance the clarity of the soils information.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



29	30	
35		

29 WEST ALEXANDRIA SE
30 FARMERSVILLE SW
35 WEST ELKTON NE

INDEX TO ADJOINING 3.75 MAPS

MIDDLETOWN NW, OHIO
3.75 MINUTE SERIES
SHEET NUMBER 36 OF 36

Soil map delineations extending beyond the dashed white quadrangle neatline are for reference only and are included on adjacent map sheets.